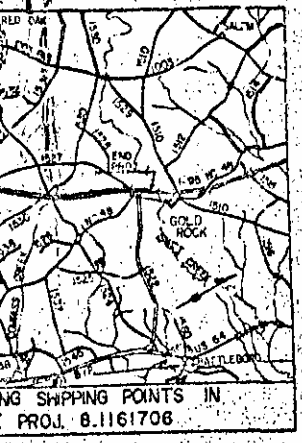
NASH COUNTY

LOCATION: I-95 FROM APPROXIMATELY 317'± SOUTH OF SR.1604 NORTHEASTERLY TO SR.1522, ± 1 MILE SOUTH OF GOLD ROCK.

TYPE: THIS CONTRACT INCLUDES GRADING, DRAINAGE, PAVING, STRUCTURES, AND SAFTEY IMPROVEMENTS.



TOTAL LENGTH F.A. PROJECT I-95-3(38)139 = 5.786 MILES
TOTAL LENGTH STATE PROJECT 8.1161706 = 5.786 MILES

DESIGN DATA

1975	ADT	15,600 - 16,000
1995	ADT	30,000 - 31,000
	DHV	11 %
	D	60 %
	T	23 %
	V	70 MPH

1607-32-160

93-32-25

1527-32-170

STA. 2237+00
END STATE PROJ. 8.1161704
END F.A. PROJ. I-95-3(31)135

STA. 2237+00
BEG. STATE PROJ. 8.1161706
BEG. F.A. PROJ. I-95-3(38)139

STA. 2+00
BEG. CONST. NC 43

EQU. 2474+35.04 L.B.
=321+85.00 L.A.

STA. 390+00
END STATE PROJ. 8.1161706
END FA PROJ I-95-3(38)139
BEG. STATE PROJ. 8.1167202
BEG. F.A. PROJ. I-95-3(52)115

SR 1610
US 64
SR 1609
SR 1604
SR 1608
SR 1607
NC 43
SR 1533
SR 1524
SWIFT CREEK
SR 1528
SR 1510
SR 1512

STA. 0+00
BEG. CONST. SR 1604

STA. 0+00
BEG. CONST. SER. RD.

STA. 21+88.11
END CONST. SER. RD.

STA. 0+00
BEG. CONST. SR 1527

SR 1527

I-95
UNDER CONST.
2 @ 24' CONC. PAV'T.
WILSON 20 MI.

STA. 24+00
END CONST.

FUTURE REST AREA

STA. 407+50 END CONST.
STATE PROJ. 8.1161706

EXIST. I-95 2 @ 24' CONC. PAV'T.
WELDON 27 MI.

STA. 25+50
END CONST. NC 43

STA. 33+00
BEG. CONST.
SR 1527
FUTURE
REST AREA

STA. 0+00
BEG. CONST. SR 1530

SR 1530

STA. 15+50
END CONST. SR 1524

STA. 33+60
END CLOS. RD.

NC 48

GOLD ROCK

SR 1604

SR 1612

STA. 0+00
BEG. CONST.
CLOSURE RD.

CREEK

SR 1526

CONTROLLED ACCESS PROJECT ACCESS BEING TO POINTS SHOWN ON PLANS AT THE RAMPS E SEPARATIONS. ALL OTHER CONNECTIONS CROSSINGS, ARE TO BE ELIMINATED.

GRAPHIC SCALES

PLAN 0 100 200 300

PROFILE (HOR.) 0 100 200 300

PROFILE (VERT) 0 10 20 30

DON MORTON
RUMMEL KLEPPER & KAHL

STA. 338+00 END PAVING
PROJECT 8.1161706

SAFETY IMPROVEMENTS

8, 1975

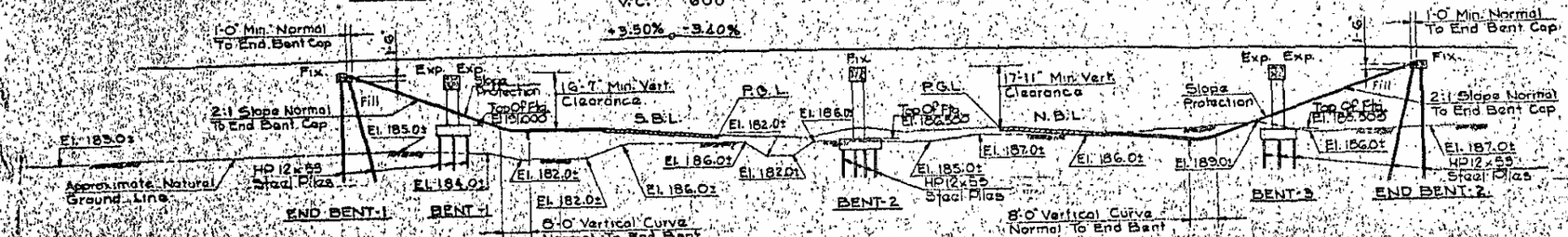
1972 STANDARD SPECIFICATIONS

THE R/W ON THIS PROJECT IS AS SHOWN ON PLANS

4	N.C.	B-1161708	
F.A. PROJECT	I-95-3(58)139		

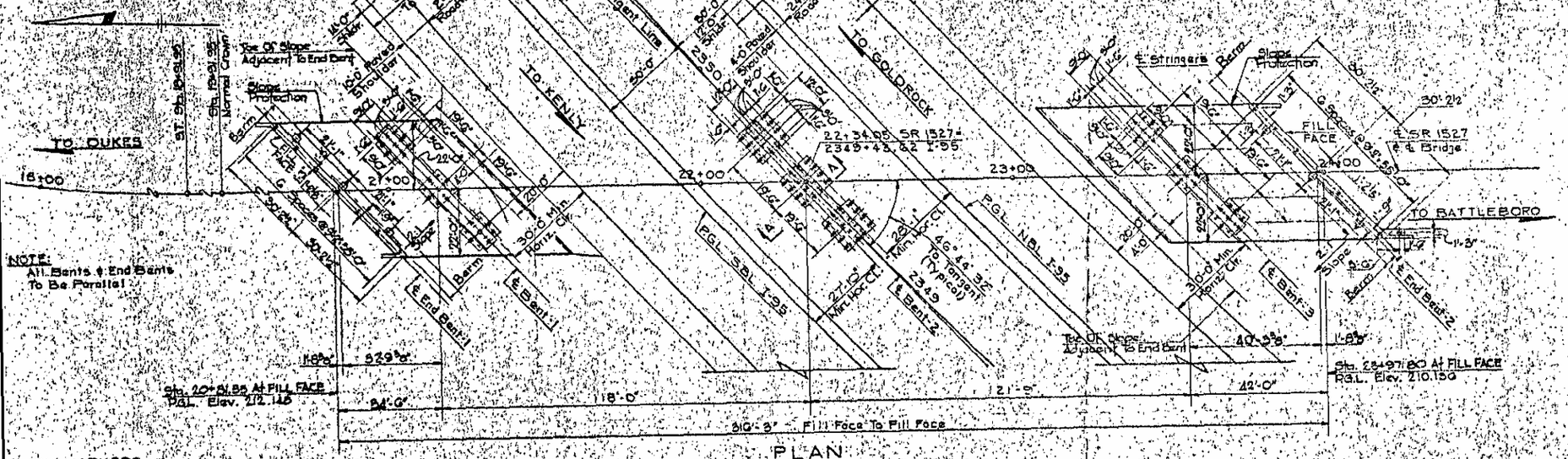
SPAN-A SPAN-B P.V.I. 21+80 Elev. 217.95 V.C. 600 SPAN-C SPAN-D

+3.50% -3.40%



SECTION ALONG ℄ BRIDGE

(BENTS SECTION A-A)



PLAN

NOTE:
All Bents & End Bents To Be Parallel

NOTES

ASSUMED LIVE LOAD: HS 15-44

REFERENCE TO SHEET S-N: For Other Data And General Notes See Sheet S-N.

PILE CAPACITIES: Piles Are Designed For Bearing Capacities Of 30 Tons Per Pile.

EXCAVATION: No Work Shall Be Started On This Bridge Until After The Roadway Section Has Been Graded. The Roadway Contractor Will Be Required To Remove The Existing Pavement And Scarify The Roadbed To A Minimum Depth Of 2'-0" Within The Area Of End Bent Piles.

PILES DRIVEN THRU FILL AT END BENTS: See Specifications.

STRUCTURAL STEEL: All Structural Steel Shall Be ASTM-A36 Grade.

PAINTING STRUCTURAL STEEL: Structural Steel For This Structure Shall Be Painted IN Accordance With Paint System 4, See Special Provisions. For galvanized High Strength Bolts, See Special Provisions.

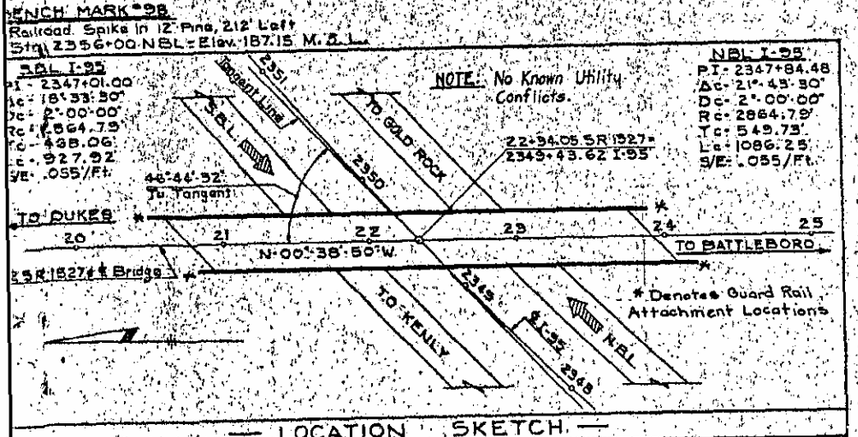
REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SPLICE DISTANCE
# 4	1'-3"
# 5	1'-9"
# 6	2'-0"
# 7	2'-3"
# 8	2'-6"
# 9	2'-9"
# 10	3'-3"
# 11	3'-6"

TOTAL BILL OF MATERIAL

	CLASS AA CONCRETE	CLASS A CONCRETE	REINFORCING STEEL	STRUCTURAL STEEL	HP12X53 STEEL PILES		LINSEED OIL CONCRETE PROTECTION	FOUNDATION EXCAVATION	4" SLOPE PROTECTION	1-BAR METAL RAILING	BRIDGE APPROACH SLABS
	CU. YDS.	CU. YDS.	LBS.	APPROX. LBS.	NO.	LIN. FT.	GALLONS	CU. YDS.	SQ. YDS.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE	384.0		86,084	325,200			29		210	621.83	
END BENT NO. 1		20.6	3,808		10	725		100			
BENT NO. 1		63.0	10,023		27	1,458		150			
BENT NO. 2		91.7	17,438		48	2,370		130			
BENT NO. 3		75.3	10,861		27	1,169			270		
END BENT NO. 2		23.6	4,379		11	545					
CURVED END BLOCK	.08		85								
TOTALS	384.8	274.2	182,618	325,200	123	6,267	29	380	480	621.83	LUMP SUM

BENCH MARK "28"
Railroad Spike in 12" Pine, 21.2' Left Sta. 2356+00 NBL - Elev. 187.15 M.S.L.



— LOCATION SKETCH —

1527-32-170

PROJECT NO. B-1161708

NASH COUNTY

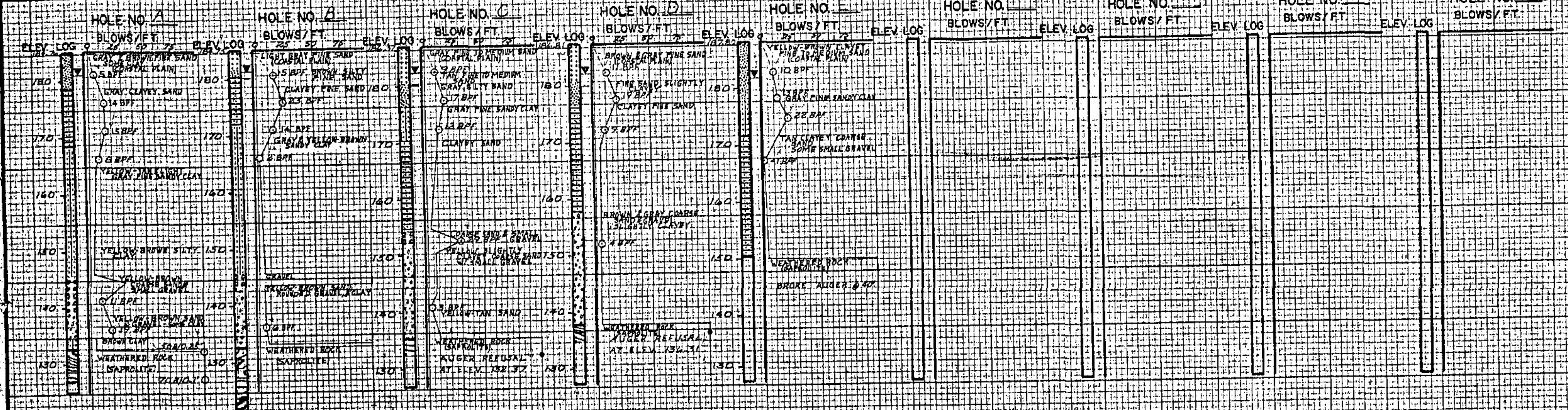
STATION: 2349+43.62 I-95
22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON S.R. 1527 OVER PROJECT I-95 BETWEEN DUKES AND BATTLEBORO

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-37
1			3			TOTAL SHEETS
2			4			76



LEGEND

SOIL & ROCK DESCRIPTION & SYMBOLS

- WELL-GRADED GRAVEL-SAND MIXTURES A-1-A
- POORLY-GRADED GRAVEL-SAND MIXTURES WITH FINES A-1-B
- POORLY-GRADED SAND A-3
- WELL-GRADED SILTY OR CLAYEY SAND A-2-4
- CLAYEY SAND A-2-6
- SANDY CLAY CHIEFLY A-7-6
- WEATHERED, RIPPABLE ROCK; SAPROLITE W/100BPF
- WATER LEVEL

NOTES

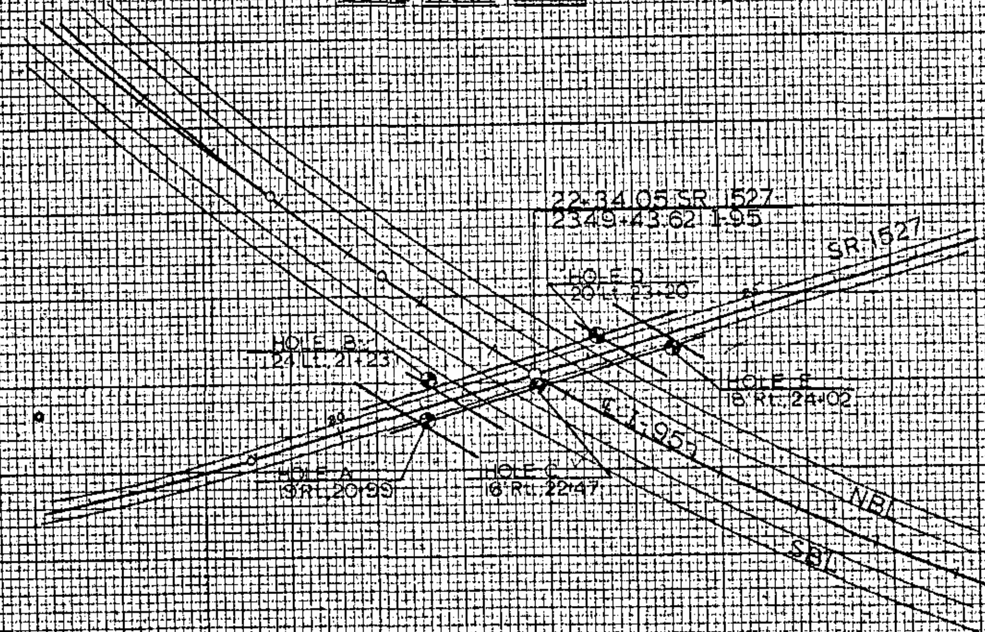
THE LOGS SHOWN ON THIS PROFILE ARE TAKEN FROM FIELD SURVEY DATA AND REPRESENT THE BEST INFORMATION AVAILABLE. FIELD PROCEDURES ARE BASED ON A.S.T.M. AND A.A.S.H.O. STANDARDS WITH BEARING CAPACITIES DERIVED FROM STANDARD PENETRATION TEST. 140 LB. HAMMER, 30 IN. FALL, 2 IN. SAMPLER.

B.M. Sta. 2348+00 NBL
B.M. Elev. 185.60

SOIL TEST RESULTS

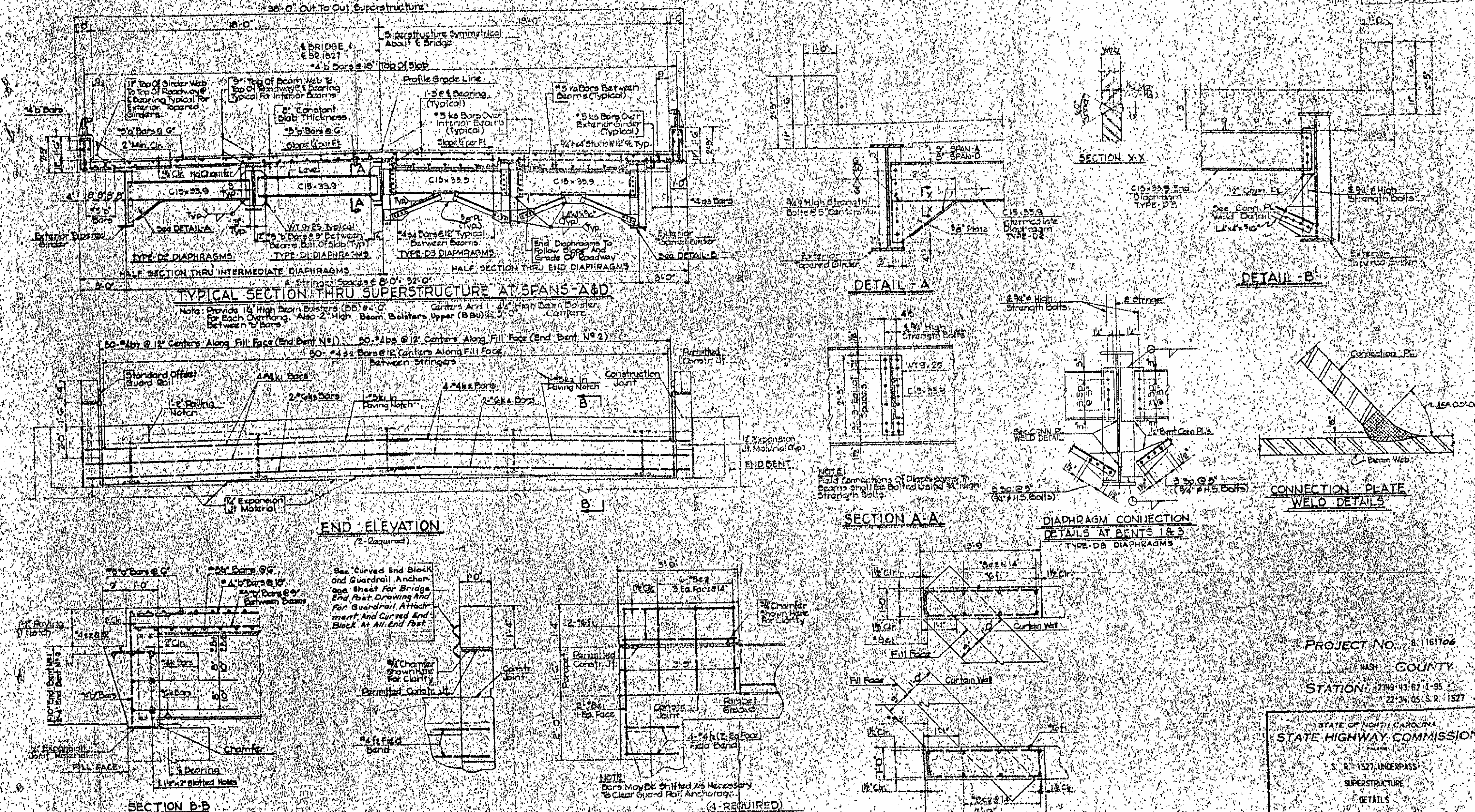
LINE	STATION	DEPTH INTERVAL	AASHO CLASS	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY
	HOLE E	4-5	A-2-4	27	9	33	37	7	23
	HOLE E	8-9	A-2-4	21	6	31	38	11	20
	HOLE E	13-14	A-7-6	42	23	3	46	10	41
	HOLE E	19-20	A-2-6	28	11	77	20	3	10
	HOLE D	3-4	A-3	19	NP	65	24	4	3
	HOLE D	8-9	A-2-4	16	NP	33	41	12	14
	HOLE D	13-14	A-2-6	30	15	59	17	12	12
	HOLE A	18-19	A-7-6	60	27	7	33	10	42
	HOLE A	23-24	A-1-B	23	NP	88	5	2	5
	HOLE A	47-48	A-1-B	21	NP	78	14	5	7
	HOLE C	13-14	A-7-6	40	21	11	32	14	43

BORE HOLE PLAN



NORTH CAROLINA
STATE HIGHWAY COMMISSION
DEPARTMENT OF LOCATIONS & SURVEYS
GEOLOGICAL DIVISION
BRIDGE FOUNDATION SURVEY

PROJECT 8.1161706
COUNTY NASH
ROUTE I-95
BRIDGE ON SR 1527
OVER I-95
SCALE: HORIZONTAL 1"=100' VERTICAL 1"=10'
SURVEY BY G.L. BUNCH (PARTY CHIEF)
ANALYSIS & REPORT BY J.F. LEDBETTER (AREA GEOLOGIST)
SUBMITTED BY A.C. DODSON (STATE HIGHWAY GEOLOGIST)
DRAWN BY M.D. Stephenson
CHECKED BY J.F. Ledbetter



Note: Provide 1½" High Beam Bolsters (BB) @ 4'-0" Centers And 1 - 4¼" High Beam Bolster For Each Overhang. Also 2" High Beam Bolsters Upper (BBU) @ 5'-0" Centers Between "b" Bars.

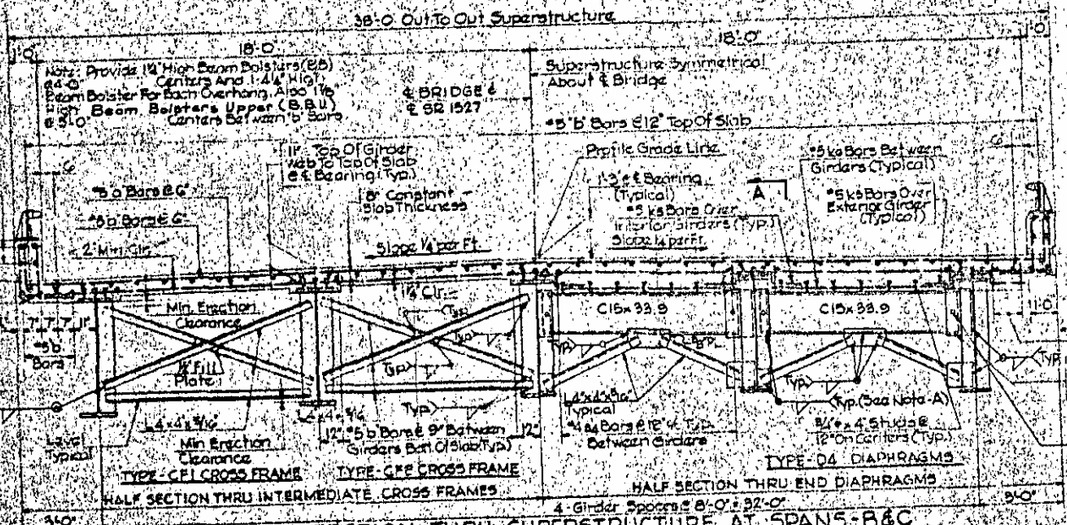
NOTE: Field Connections Of Diaphragms To Beams Shall Be Bolted Using ¾" High Strength Bolts.

PROJECT NO. 8.1161706
NASH COUNTY
STATION: 2749+43.62 I-95
22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
S. R. 1527 UNDERPASS
SUPERSTRUCTURE
DETAILS

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH NORTH CAROLINA

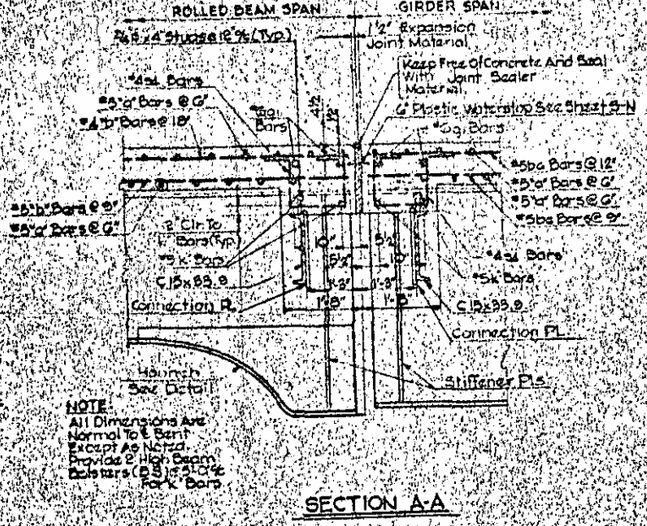
REVISIONS



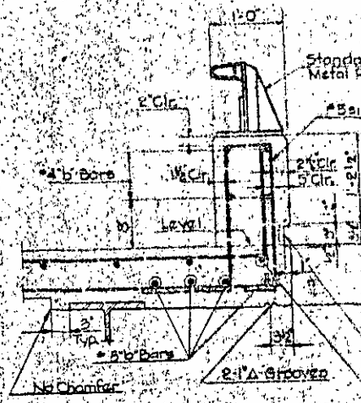
TYPICAL SECTION THRU SUPERSTRUCTURE AT SPANS-B&C

Note-A: Connections Of 4"x4"x 9/16" Angles To Connection Plates Shall Be Made With A Minimum Length Of 17" Of ¼" Fillet Weld.

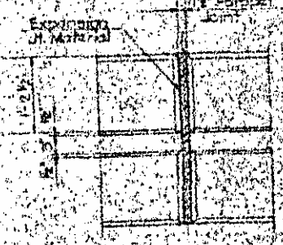
Note-B: Connections Of 4"x4"x 9/16" Angles To Stiffeners Shall Be Made With A Minimum Length Of 13" Of ¼" Fillet Weld.



SECTION A-A



PARAPET AND RAIL DETAIL



PARAPET GROOVE DETAIL

Note: At the contractor's option, but without change in the contract price for structural steel, he may submit shop welded or high strength bolted connection details for approval in lieu of the field welded connection details as shown.

Note: At The Contractors Option, He May Use Erection Bolts As Shown On Plans.

PROJECT NO. 8.1161706

NASH COUNTY

STATION: 2149+93.62 I-95
22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

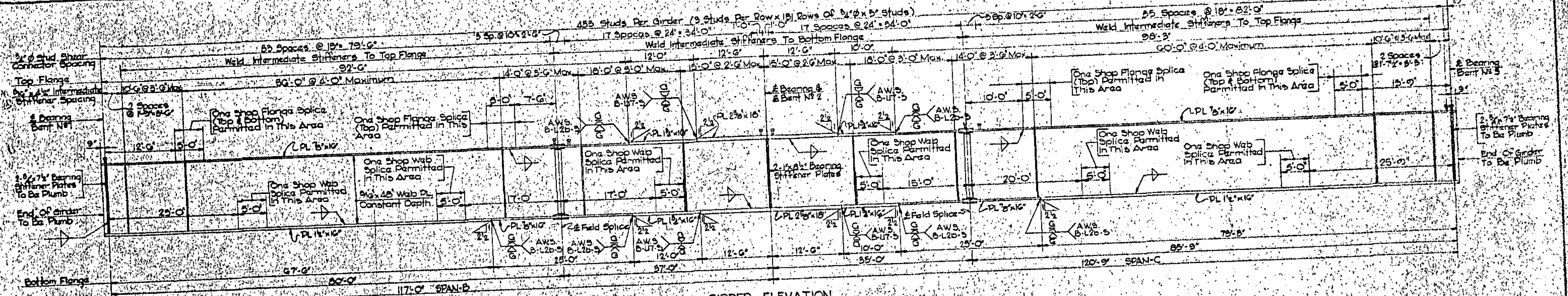
S. R. 1527 UNDERPASS
SUPERSTRUCTURE
DETAILS

REVISIONS				S-40
				76

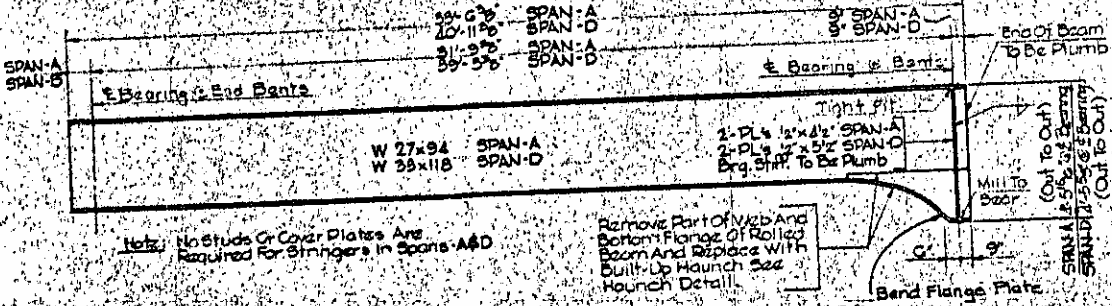
RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

8 of 24

8.1161706
F-95-3(39)39



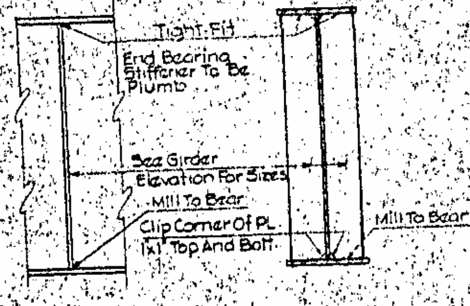
GIRDER ELEVATION



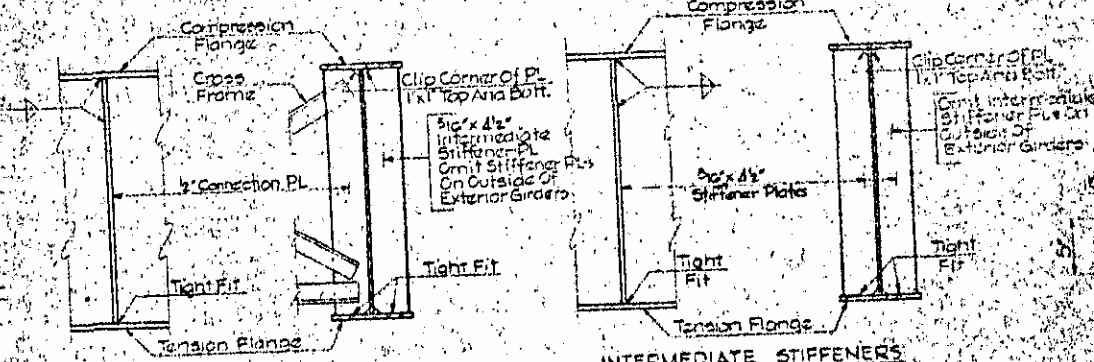
Note: No Studs Or Cover Plates Are Required For Stringers In Spans A&D

ELEVATION - INTERIOR STRINGER - SPANS A&D

ROLLED BEAM



BEARING STIFFENERS

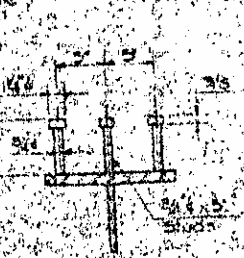


AT CROSS FRAMES

INTERMEDIATE STIFFENERS

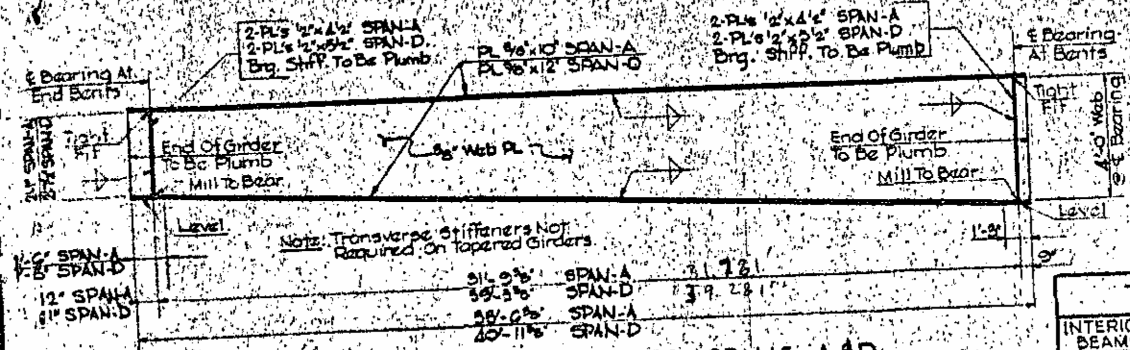
(Alternate Intermediate Stiffeners Except On Exterior Girders. See Note-'A')

GIRDER STIFFENER DETAILS



STUD DETAILS

Note-'A'
Single Intermediate Transverse Stiffeners Shall Be Used On All Girders Of Spans B&C. Place Intermediate Stiffeners On Alternate Sides Of The Web Of Interior Girders And On The Inside Of The Web Of Exterior Girders.

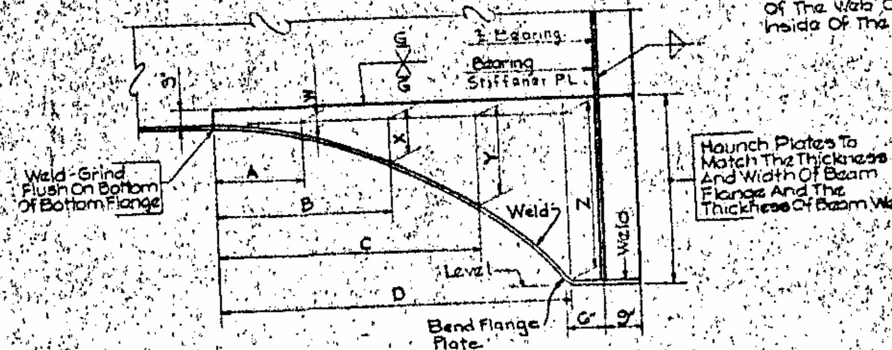


Note: Transverse Stiffeners Not Required On Tapered Girders.

ELEVATION - EXTERIOR STRINGER - SPANS A&D

TAPERED GIRDER

TABLE OF DIMENSIONS								
INTERIOR BEAMS	A	W	B	X	C	Y	D	Z
SPAN-A	1'-1 9/16"	1 1/16"	2'-5 9/16"	6 13/16"	3'-4 3/4"	1'-3 1/4"	4'-6 5/8"	2'-3 5/16"
SPAN-D	10 7/16"	1 9/16"	1'-8 7/8"	3 1/4"	2'-7 9/16"	11 3/4"	3'-5 3/4"	1'-8 7/8"



Note: Haunch Makeup Other Than That Shown May Be Submitted For Approval. Types Of Welds Used Shall Be Approved Prequalified Welds. Radiographic Inspection Of These Welds Will Not Be Required.

HAUNCH DETAIL

PROJECT NO. 8.1161706

NASH COUNTY

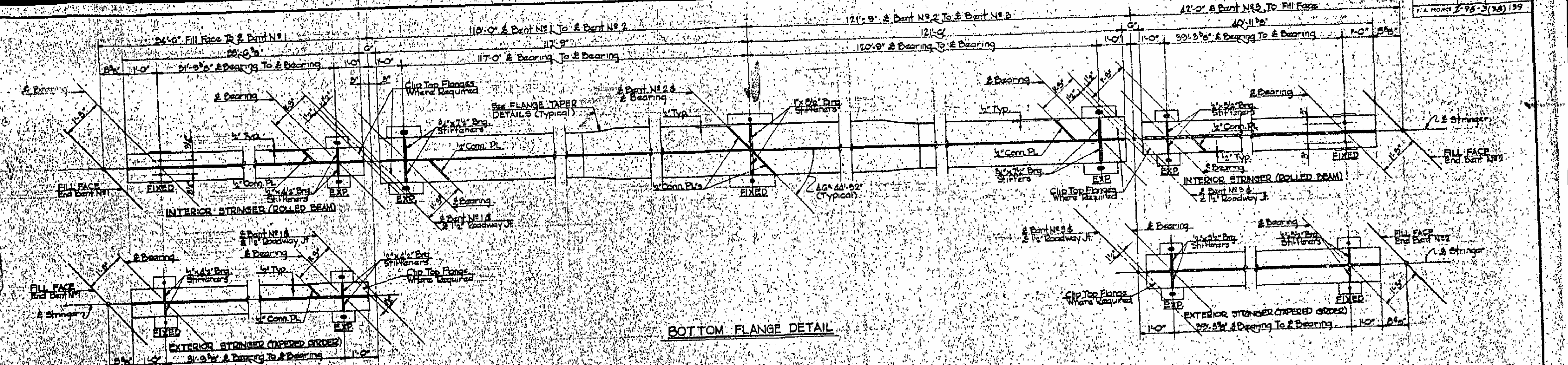
STATION 2399+43.62 I-95
22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

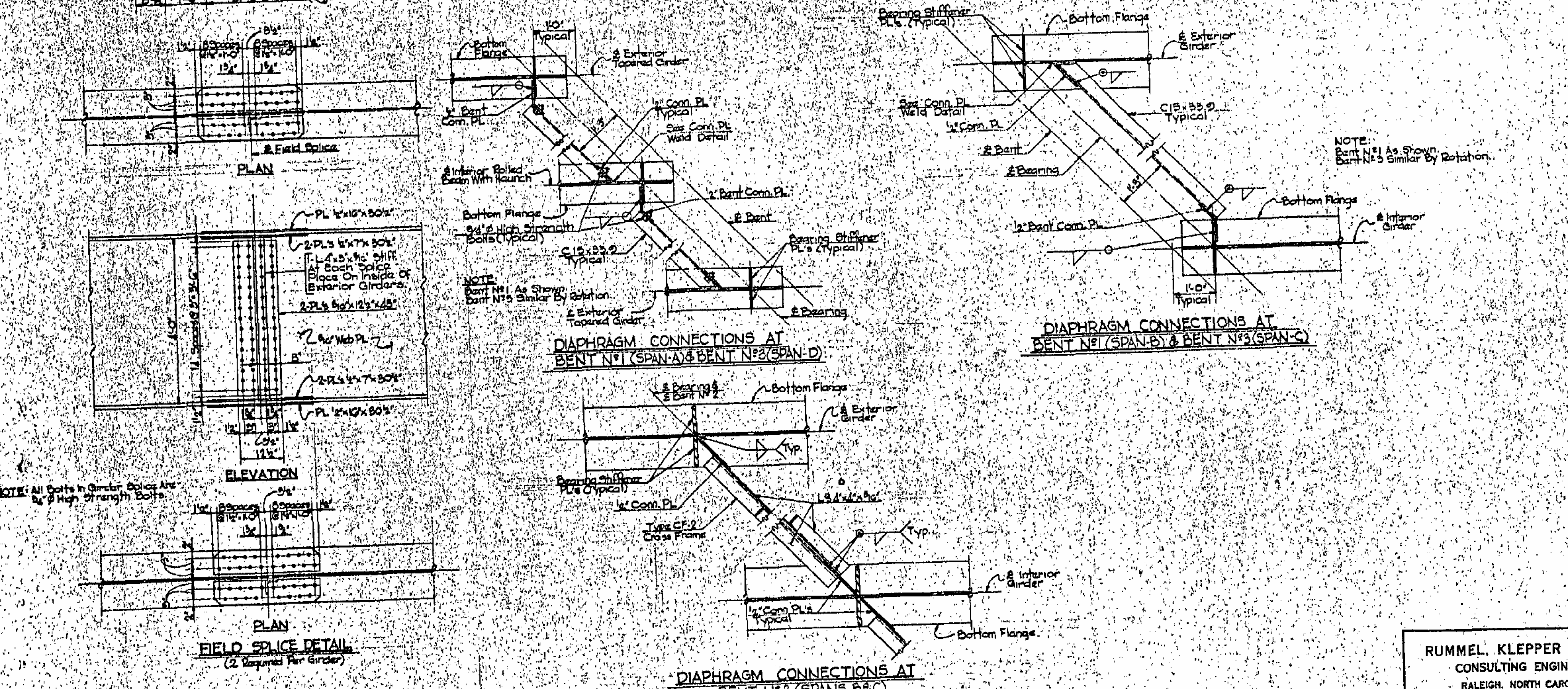
S.R. 1527 UNDERPASS
SUPERSTRUCTURE
DETAILS

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

S-41



BOTTOM FLANGE DETAIL

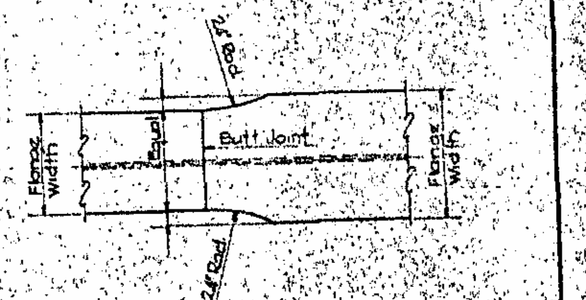


FIELD SPLICE DETAIL
(2 Required Per Girder)

DIAPHRAGM CONNECTIONS AT BENT Nº1 (SPAN-A) & BENT Nº3 (SPAN-D)

DIAPHRAGM CONNECTIONS AT BENT Nº1 (SPAN-B) & BENT Nº3 (SPAN-C)

DIAPHRAGM CONNECTIONS AT BENT Nº2 (SPANS B&C)



FLANGE TAPER DETAIL

PROJECT NO. 8.1161706

NASH COUNTY

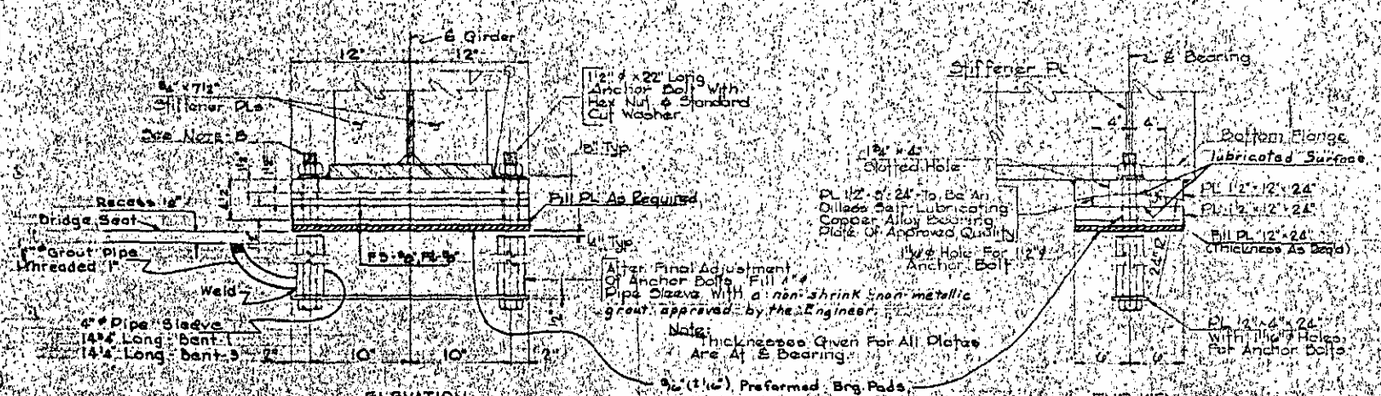
STATION: 2349+43.62 I-95 = 22+34.05 S.R.-1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

S. R. 1527 UNDERPASS
SUPERSTRUCTURE
DETAILS

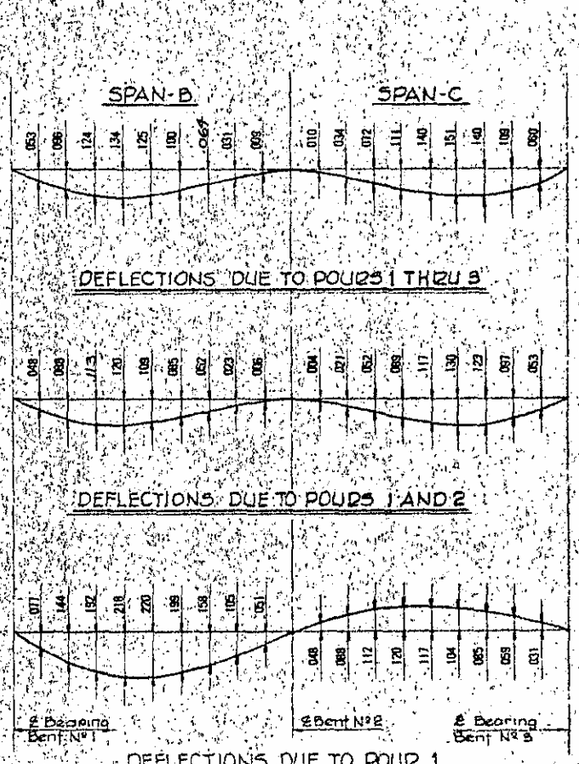
RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			S-42
2			4			76

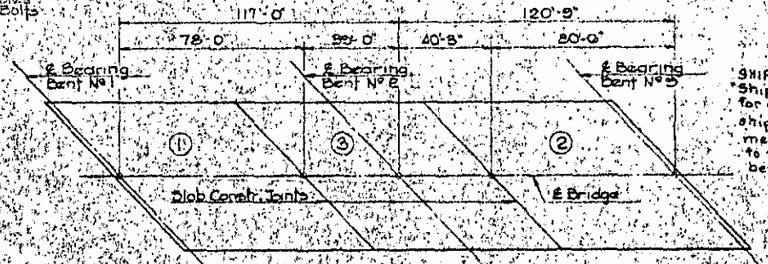


BEARING ASSEMBLIES REQUIRED		
MARK	LOCATION	Nº REQ'D
EB-3	BENT 1	8
	BENT 3	5
FB-3	BENT 2	5

FILL PLATES REQUIRED			
MARK	DRG. ASS'Y.	Nº REQ'D.	THICKNESS
F3	EB-3	1	5/8"
F4	EB-3	1	5/8"



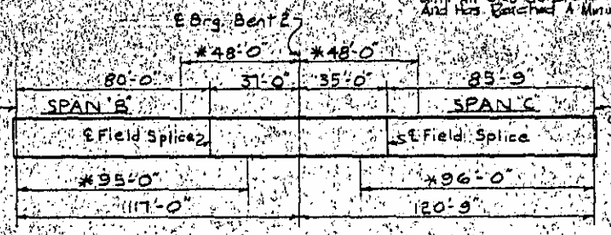
Note: All Deflection Ordinates Are In Feet And Are Given At The Tenth Points Of The Span Between Bearings For Interior Girders Only. Deflections Are For Weight Of Concrete Slab Only.



ROADWAY SLAB POURING SEQUENCE

Previously Cast Concrete Units In Spans B & C Shall Attain A Minimum Compressive Strength Of 3000 p.s.i. Before Additional Concrete Pours Are Made.

Parapet Concrete In Spans B & C Shall Not Be Cast Until All Slab Concrete In Spans B & C Has Been Cast And Has Reached A Minimum Compressive Strength Of 3000 p.s.i.



* Charpy V-Notch Tests will be required for top or bottom flange plates which falls within limits shown in Span B and Span C. Also Charpy V-Notch Tests will be required for all web plates, web splice plates, flange splice plates in Span B and Span C, bottom flange plates of the girders in Span A & Span D and all rolled beams in Span A and D. For Charpy V-Notch Tests, See Special Provisions

NOTES

CAMBER: Girders Shall Be Fabricated With Camber To Compensate For The Deflection Caused By The Combined Weights Of The Structural Steel And The Superimposed Dead Loads And The Vertical Curve Ordinate. Cambered Girder Lengths Shall Be Adjusted And Bearings Are To Be Placed On The Cambered Girder So As To Be Aligned With The Anchors After Dead Load Deflection Has Occurred. Shop Plans Shall Be Prepared Accordingly.

FIELD CONNECTIONS: All Field Connections Not Welded Shall Be Made With 3/4" ø High Strength Bolts Unless Otherwise Noted.

SHOP SPLICES: All Shop Splices In Flange And Web Plates Shall Be Made Prior To Welding Flange Plates To Web Plates: No Splices Other Than Those Shown On The Plans Will Be Permitted In The Flange Plates; However, Additional Shop Web Splices Will Be Allowed Within The Areas Shown In The Details. The Location Of These Splices Shall Be Shown On The Shop Plans.

WELDING: All Welding Shall Conform To The Latest AWS Specification For Welded Highway And Railroad Bridges And The Special Provisions.

STUDS: For Description Of Studs See Special Provisions.

FIELD SPLICES: All Bolts In Field Splices Are 3/4" ø High Strength Bolts. Spacing Of Studs On Top Flange Splice Plate May Be Adjusted If Necessary To Clear Bolts. However, The Total Number Of Studs Required On Splice Plate Shall Not Be Less Than That Required By Using Normal Spacing.

STRUCTURAL STEEL: All Structural Steel To Be ASTM - A36.

STRUCTURAL STEEL ERECTION: Erection Of Structural Steel Shall Be Completed For Spans B & C Before False Work Or Form Work For Spans B & C Are Placed.

BEARING ASSEMBLIES: For Requirements Of Self-Lubricating Plate, See Special Provisions.

All Bearing Assemblies Except Self-Lubricating Plate Shall Be Galvanized.

Masonry Plates Shall Be Straight And Smooth On Both Sides. No Surface Finish Required.

At The Contractors Option, Fill Plates May Be Combined With Masonry Pls.
For Location Of Slots In Beams and Girders To Accomodate "K" Bars, See Superstructure Sections & Details.

SHIPPING DETAILS

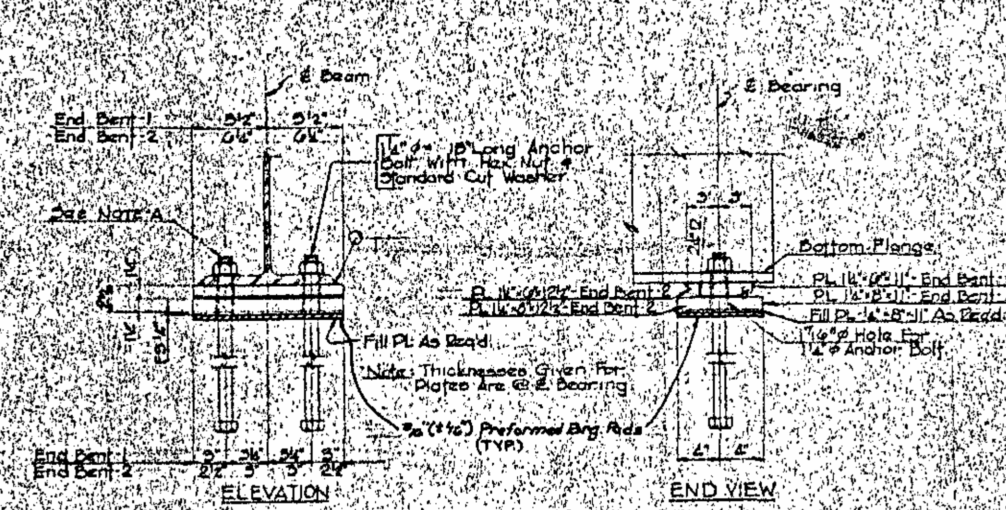
"Shipping details for beams and Girders shall be submitted for approval, indicating the top flange location during shipment, and in all cases showing the web vertical. The method of shipment, position of the vehicle, and attachments to the beams or girders of any shipping restraints shall be clearly detailed."

PROJECT NO. 8.1161706
NASH COUNTY
STATION: 2318+43.62 1-95 + 22+34.05 S.R. 1527

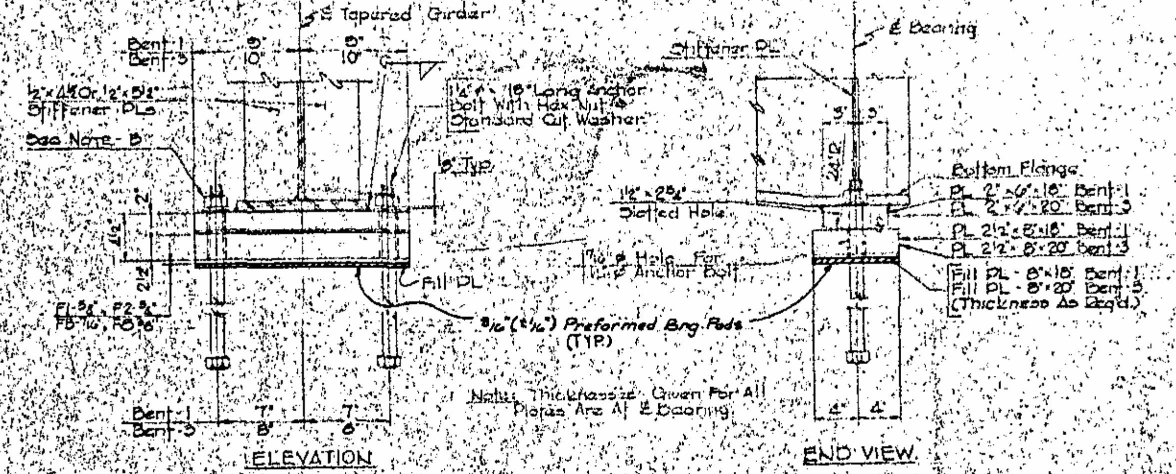
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
S. R. 1527 UNDERPASS
SUPERSTRUCTURE
BEARING SHOES

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

S-43
76



FIXED BEARING ASSEMBLY ~ FB-1
INTERIOR ~ ROLLED BEAMS ~ SPANS A & D



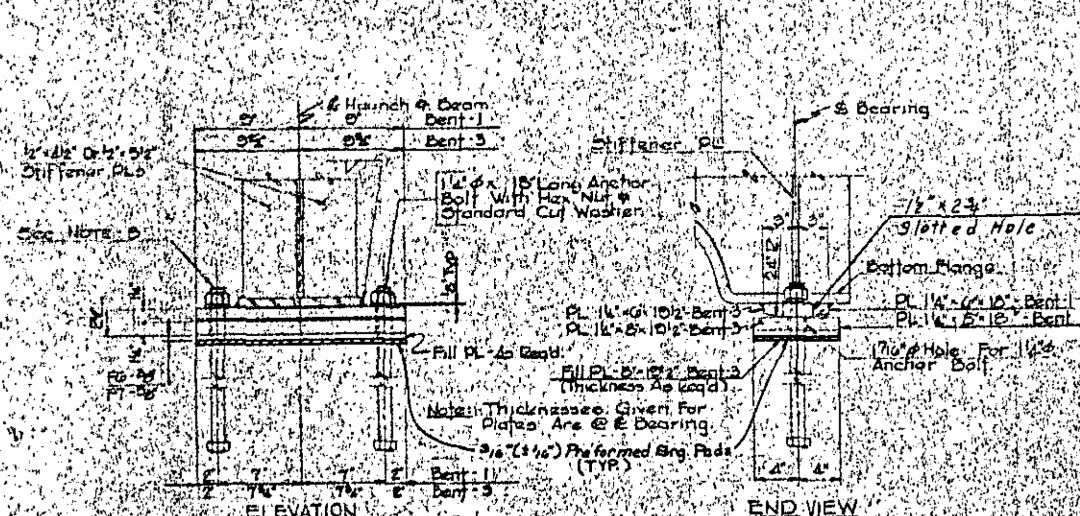
EXPANSION BEARING ASSEMBLY EB-2
EXTERIOR ~ TAPERED GIRDER ~ SPANS A & D

Note A: At Fixed Bearings, Nuts For Anchor Bolts Are To Be Tightened Finger Tight And Then Backed Off ½ Turn. The Threads Of The Nut And Bolt Shall Then Be Burred With A Sharp Pointed Tool.
Note B: At Expansion Bearings, The Threads Of The Nut And Bolt Shall Be Burred With A Sharp Point Tool.

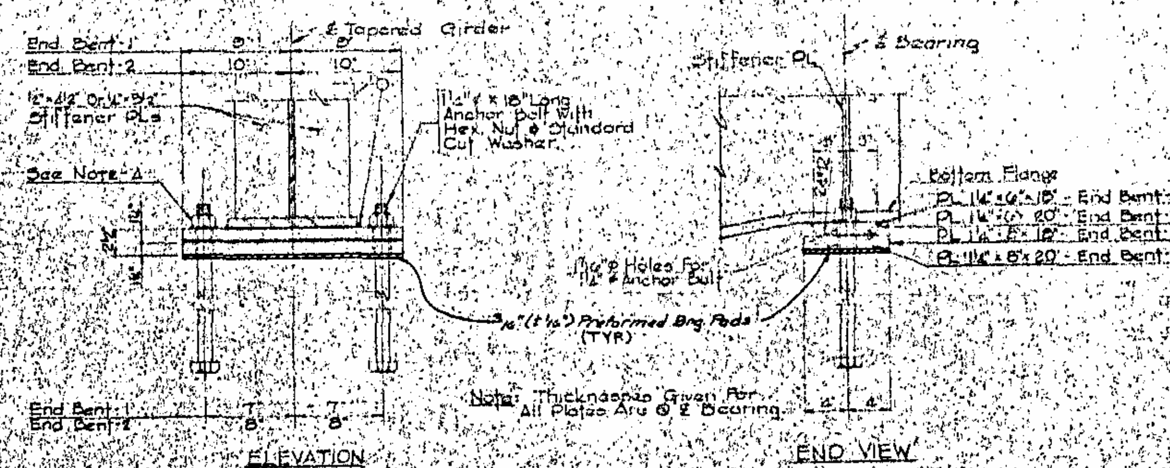
Note: In Spans A And D All Bearing Assemblies Shall Be Galvanized.
Masonry Plates For Spans A And D To Be Straight And Smooth On Both Sides. No Surface Finish Required.

BEARING ASSEMBLIES REQUIRED		
MARK	LOCATION	Nº REQ'D
EB-1	BENT-1	3
EB-1	BENT-3	3
EB-2	BENT-1	2
EB-2	BENT-3	2
FB-1	END BENT-1	3
FB-1	END BENT-2	3
FB-2	END BENT-1	2
FB-2	END BENT-2	2

FILL PLATES REQUIRED			
MARK	BRG. ASS'Y	Nº REQ'D	THICKNESS
F1	EB-2 Bent-1	1	⅝"
F2	EB-2 Bent-1	1	¾"
F3	EB-2 Bent-3	1	$^{5}/_{16}$"
F6	EB-1 Bent-3	1	⅜"
F7	EB-1 Bent-3	1	⅝"
F8	EB-2 Bent-3	1	⅝"
F9	FB-1 End Bent 2	[illegible]	¼"



EXPANSION BEARING ASSEMBLY ~ EB-1
INTERIOR ~ ROLLED BEAMS ~ SPANS A & D



FIXED BEARING ASSEMBLY FB-2
EXTERIOR - TAPERED GIRDER - SPANS A & D

PROJECT NO. 8.11617
NASH COUNTY
STATION: 2749+43.62 I-95
27+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
S. R. 1527 UNDERPASS
SUPERSTRUCTURE
BEARING SHOES

RUMMEL, KLEPPER & KAHL
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RALEIGH NORTH CAROLINA

S-44
76

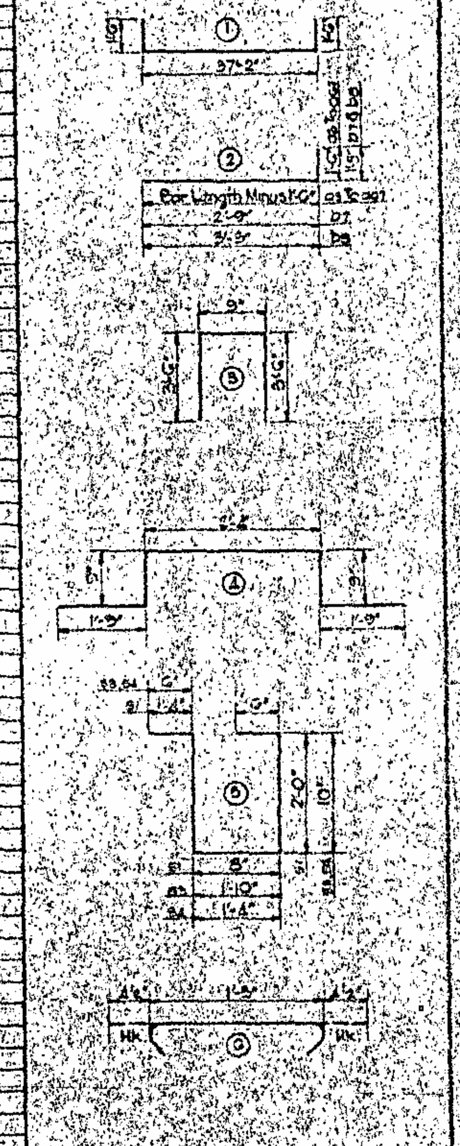
BILL OF MATERIAL

BAR	NUMBER SPAN-A	NUMBER SPANS B&C	NUMBER SPAN-C	SIZE	TYPE	LENGTH	WEIGHT SPAN-A	WEIGHT SPANS B&C	WEIGHT SPAN-D
a1	1	412	16	#5	①	40'-2"	42	17,260	670
a2	—	411	15		Str.	37'-8"		16,147	689
a3	2	2	2		②	37'-4"	78	78	78
a4						36'-10"	76	76	76
a5						36'-4"	76	76	76
a6						35'-9"	74	74	74
a7						35'-3"	74	74	74
a8						34'-8"	72	72	72
a9						34'-2"	72	72	72
a10						33'-8"	70	70	70
a11						33'-1"	70	70	70
a12						32'-7"	68	68	68
a13						32'-1"	66	66	66
a14						31'-6"	66	66	66
a15						31'-0"	64	64	64
a16						30'-5"	64	64	64
a17						29'-11"	62	62	62
a18						29'-5"	62	62	62
a19						28'-10"	60	60	60
a20						28'-4"	60	60	60
a21						27'-10"	58	58	58
a22						27'-3"	56	56	56
a23						26'-9"	56	56	56
a24						26'-2"	54	54	54
a25						25'-8"	54	54	54
a26						25'-2"	52	52	52
a27						24'-7"	52	52	52
a28						24'-1"	50	50	50
a29						23'-7"	50	50	50
a30						23'-0"	48	48	48
a31						22'-6"	46	46	46
a32						21'-11"	46	46	46
a33						21'-5"	44	44	44
a34						20'-11"	44	44	44
a35						20'-4"	42	42	42
a36						19'-10"	42	42	42
a37						19'-4"	40	40	40
a38						18'-9"	40	40	40
a39						18'-3"	38	38	38
a40						17'-8"	36	36	36
a41						17'-2"	36	36	36
a42						16'-8"	34	34	34
a43						16'-1"	34	34	34
a44						15'-7"	32	32	32
a45						15'-1"	32	32	32
a46						14'-6"	30	30	30
a47						14'-0"	30	30	30
a48						13'-5"	28	28	28
a49						12'-11"	26	26	26
a50						12'-5"	26	26	26
a51						11'-10"	24	24	24
a52						11'-4"	24	24	24
a53						10'-10"	22	22	22
a54						10'-3"	22	22	22
a55						9'-9"	20	20	20
a56						9'-2"	20	20	20
a57						8'-8"	18	18	18
a58						8'-2"	16	16	16
a59						7'-7"	16	16	16
a60	2	2	2	#5	②	7'-1"	14	14	14

BAR	NUMBER SPAN-A	NUMBER SPANS B&C	NUMBER SPAN-D	SIZE	TYPE	LENGTH	WEIGHT SPAN-A	WEIGHT SPANS B&C	WEIGHT SPAN-D
a61	2	2	2	#5	②	6'-7"	14	14	14
a62						6'-0"	12	12	12
a63						5'-6"	12	12	12
a64						4'-11"	10	10	10
a65						4'-5"	10	10	10
a66						3'-11"	8	8	8
a67	2	2	2	#5	②	3'-4"	8	8	8
a71	2	2	2	#5	Str.	36'-4"	76	76	76
a72						35'-9"	74	74	74
a73						35'-3"	74	74	74
a74						34'-8"	72	72	72
a75						34'-2"	72	72	72
a76						33'-8"	70	70	70
a77						33'-1"	70	70	70
a78						32'-7"	68	68	68
a79						32'-1"	66	66	66
a80						31'-6"	66	66	66
a81						31'-0"	64	64	64
a82						30'-5"	64	64	64
a83						29'-11"	62	62	62
a84						29'-5"	62	62	62
a85						28'-10"	60	60	60
a86						28'-4"	60	60	60
a87						27'-10"	58	58	58
a88						27'-3"	56	56	56
a89						26'-9"	56	56	56
a90						26'-2"	54	54	54
a91						25'-8"	54	54	54
a92						25'-2"	52	52	52
a93						24'-7"	52	52	52
a94						24'-1"	50	50	50
a95						23'-7"	50	50	50
a96						23'-0"	48	48	48
a97						22'-6"	46	46	46
a98						21'-11"	46	46	46
a99						21'-5"	44	44	44
a100						20'-11"	44	44	44
a101						20'-4"	42	42	42
a102						19'-10"	42	42	42
a103						19'-4"	40	40	40
a104						18'-9"	40	40	40
a105						18'-3"	38	38	38
a106						17'-8"	36	36	36
a107						17'-2"	36	36	36
a108						16'-8"	34	34	34
a109						16'-1"	34	34	34
a110						15'-7"	32	32	32
a111						15'-1"	32	32	32
a112						14'-6"	30	30	30
a113						14'-0"	30	30	30
a114						13'-5"	28	28	28
a115						12'-11"	26	26	26
a116						12'-5"	26	26	26
a117						11'-10"	24	24	24
a118						11'-4"	24	24	24
a119						10'-10"	22	22	22
a120	2	2	2	#5	Str.	10'-3"	22	22	22

BAR	NUMBER SPAN-A	NUMBER SPANS B&C	NUMBER SPAN-D	SIZE	TYPE	LENGTH	WEIGHT SPAN-A	WEIGHT SPANS B&C	WEIGHT SPAN-D
a121	2	2	2	#5	Str.	9'-9"	20	20	20
a122						9'-2"	20	20	20
a123						8'-8"	18	18	18
a124						8'-2"	16	16	16
a125						7'-7"	16	16	16
a126						7'-1"	14	14	14
a127						6'-7"	14	14	14
a128						6'-0"	12	12	12
a129						5'-6"	12	12	12
a130						4'-11"	10	10	10
a131						4'-5"	10	10	10
a132						3'-11"	8	8	8
a133						3'-4"	6	6	6
a134						2'-10"	6	6	6
a135						2'-4"	4	4	4
a136	2	2	2	#5	Str.	1'-9"	4	4	4
b11	—	190	—	#5	Str.	49'-4"	—	9776	—
b1	16	—	—	#4	Str.	18'-3"	195	—	—
b2	44	—	—	#5		34'-1"	1,564	—	—
b3	—	—	10	#4		22'-0"	—	—	295
b4	—	—	44	#5		41'-7"	—	—	1,908
b5	—	72	—	#4		27'-10"	—	1,339	—
b6	—	220	—	#5	Str.	49'-4"	—	11,320	—
b7	50	—	—	#4	②	4'-0"	134	—	—
b8	—	—	50	#4	②	4'-6"	—	—	150
b9	52	—	—	#4	Str.	17'-9"	617	—	—
b10	—	—	52	#4	Str.	21'-6"	—	—	747
e1	4	—	4	#8	Str.	4'-6"	48	—	48
e2	12	—	12	#8	Str.	2'-8"	85	—	85
f1	4	—	4	#6	③	7'-9"	47	—	47
f2	8	—	8	#4	Str.	3'-6"	19	—	19
g1	2	4	2	#6	Str.	49'-0"	147	294	147
k1	5	—	5	#4	Str.	27'-7"	92	—	92
k2	5	—	5	#4		23'-11"	87	—	87
k3	2	—	2	#6		28'-4"	85	—	85
k4	2	—	2	#6	Str.	25'-11"	78	—	78
k5	10	20	10	#5	④	7'-4"	76	153	76
k6	8	16	8	#5	Str.	10'-6"	88	175	88
s1	66	480	80	#5	⑥	6'-6"	447	3,254	542
s2	50	—	50	#4	⑥	2'-0"	67	—	67
s3	4	8	4	#4	⑤	4'-6"	12	24	12
s4	40	80	40	#4	⑤	4'-0"	107	214	107

BAR TYPES



Note: All Bar Dimensions Are Out To Out

TOTAL REINFORCING		86,024 Lbs.
CLASS 'AA' CONCRETE BREAKDOWN		
SPAN-A	SLAB	48.0 C.Y.
	PARAPET	5.9 C.Y.
	END POSTS	0.4 C.Y.
SPAN-B & SPAN-C	POUR Nº1	95.9 C.Y.
	POUR Nº2	96.9 C.Y.
	POUR Nº3	62.4 C.Y.
	PARAPET	26.4 C.Y.
SPAN-D	SLAB	52.0 C.Y.
	PARAPET	4.7 C.Y.
	END POSTS	0.4 C.Y.
	TOTAL	384.0 C.Y.

PROJECT NO. 8.1161706

NASH COUNTY

STATION: 2349+43.62 I-95 = 22+34.05 S.R. 1527

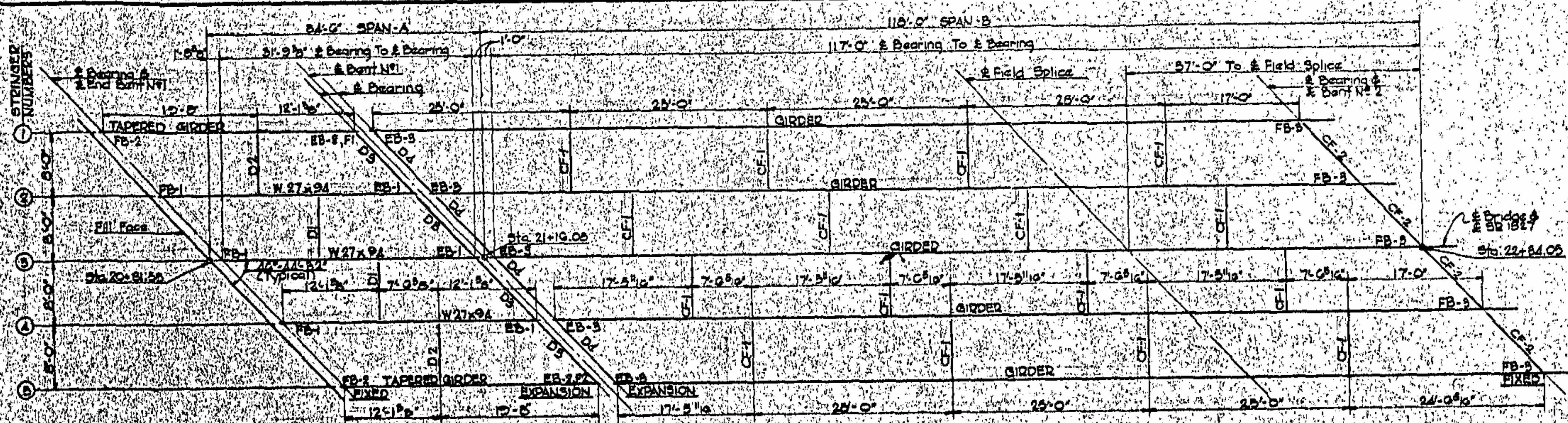
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

S. R. 1527 UNDERPASS
SUPERSTRUCTURE
DETAILS

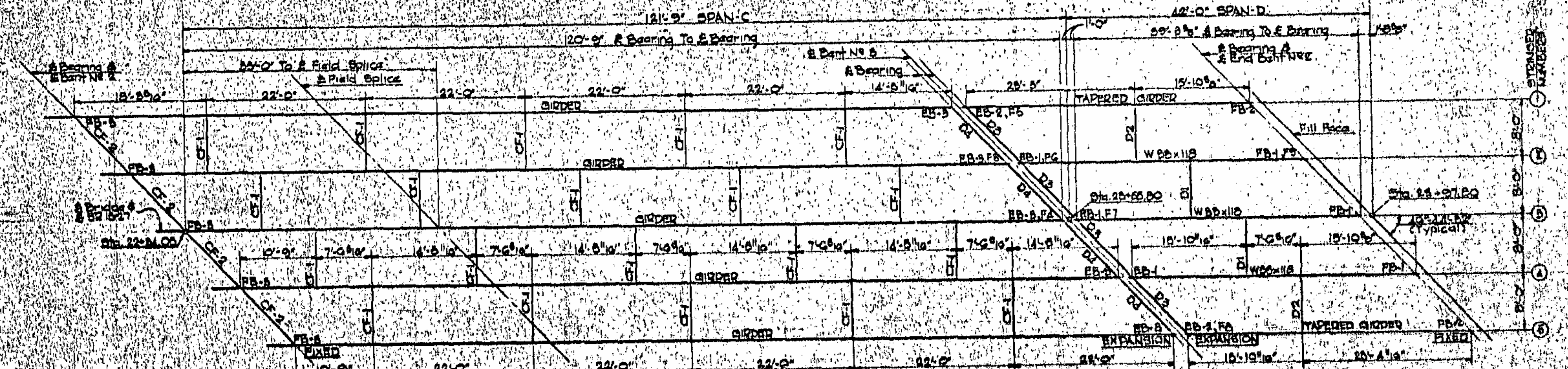
RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH NORTH CAROLINA

REVISIONS

4	N.C.	8.1161706
F.A. PROJECT	I-95-3(37)134	



FRAMING PLAN - SPANS A & B



FRAMING PLAN - SPANS C & D

PROJECT NO. 8.1161706

NASH **COUNTY**

STATION: 2349+43.62 I-95 = 22+34.05 S.R. 1527

DEAD LOAD DEFLECTION AND CAMBER SCHEDULE

	Span A		Span B																		℄ Bent 2	
	Mid Point		1/10 Span		2/10 Span		3/10 Span		4/10 Span		5/10 Span		6/10 Span		7/10 Span		8/10 Span		9/10 Span			
	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.
DEFLECTION DUE TO WT. OF STEEL	.002	.001	.014	.014	.026	.026	.033	.033	.038	.038	.033	.033	.026	.026	.016	.016	.008	.008	.002	.002	.000	.000
DEFLECTION DUE TO WT. OF SLAB	.018	.013	.060	.049	.092	.089	.116	.114	.128	.121	.118	.112	.091	.088	.058	.058	.027	.026	.007	.008	.000	.000
DEFLECTION DUE TO WT. OF COMPOSITE LOADS	.004	.003	.010	.010	.018	.018	.023	.024	.026	.027	.026	.026	.022	.022	.016	.016	.009	.009	.003	.003	.000	.000
TOTAL DEAD LOAD DEFLECTION	.024	.017	.074	.073	.136	.133	.174	.171	.188	.184	.174	.171	.139	.136	.090	.088	.044	.043	.012	.011	.000	.000
VERTICAL CURVE ORDINATE	.015	.015	.072	.072	.128	.128	.168	.168	.192	.192	.200	.200	.192	.192	.168	.168	.128	.128	.072	.072	.000	.000
REQUIRED BEAM CAMBER	.039	.032	.146	.145	.264	.261	.342	.339	.380	.376	.374	.371	.331	.328	.256	.256	.172	.171	.084	.083	.000	.000

	Span C																		Span D	
	1/10 Span		2/10 Span		3/10 Span		4/10 Span		5/10 Span		6/10 Span		7/10 Span		8/10 Span		9/10 Span		Mid Point	
	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.
DEFLECTION DUE TO WT. OF STEEL	.003	.003	.011	.011	.022	.022	.034	.034	.042	.042	.045	.045	.041	.041	.032	.032	.018	.018	.003	.002
DEFLECTION DUE TO WT. OF SLAB	.012	.011	.036	.037	.078	.075	.118	.114	.146	.141	.157	.151	.145	.140	.112	.109	.092	.058	.023	.020
DEFLECTION DUE TO WT. OF COMPOSITE LOADS	.004	.004	.011	.011	.018	.020	.026	.027	.030	.031	.031	.032	.028	.028	.021	.022	.011	.012	.006	.005
TOTAL DEAD LOAD DEFLECTION	.019	.018	.060	.059	.118	.117	.178	.176	.216	.214	.233	.226	.214	.209	.165	.163	.091	.089	.032	.027
VERTICAL CURVE ORDINATE	.077	.077	.136	.136	.178	.178	.204	.204	.213	.213	.204	.204	.178	.178	.136	.136	.077	.077	.023	.023
REQUIRED BEAM CAMBER	.096	.095	.196	.195	.296	.295	.382	.379	.431	.427	.437	.432	.383	.388	.301	.299	.168	.166	.055	.050

CHECKED BY ______ DATE Sept 72

All Deflections Are In Feet.

... Line Varies

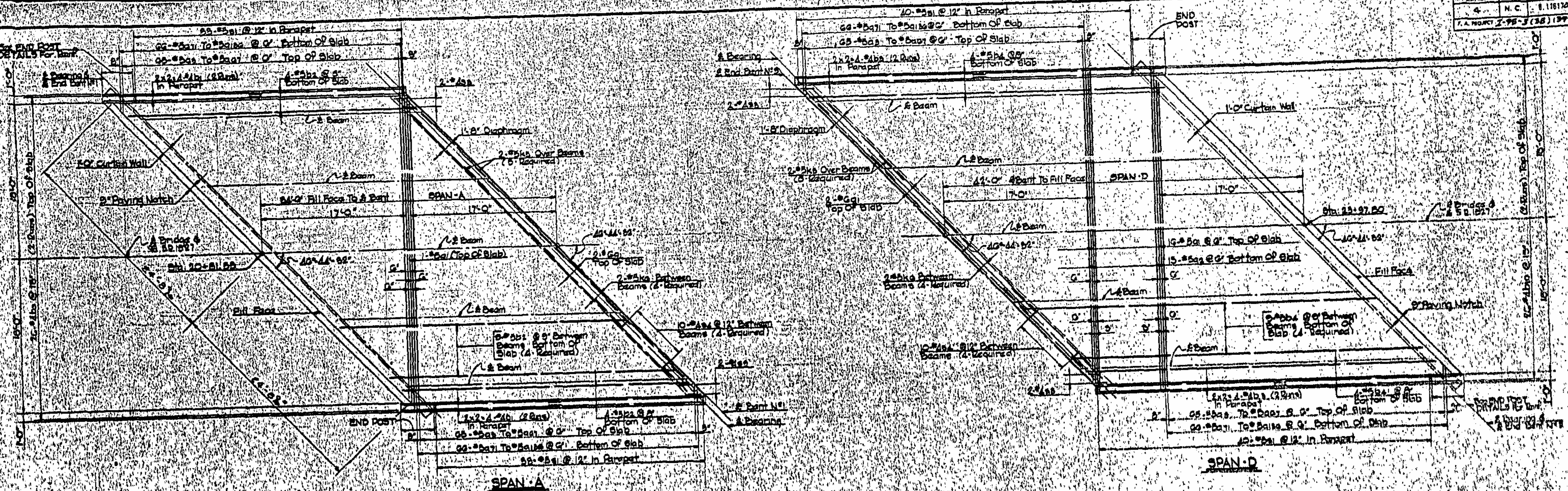
RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

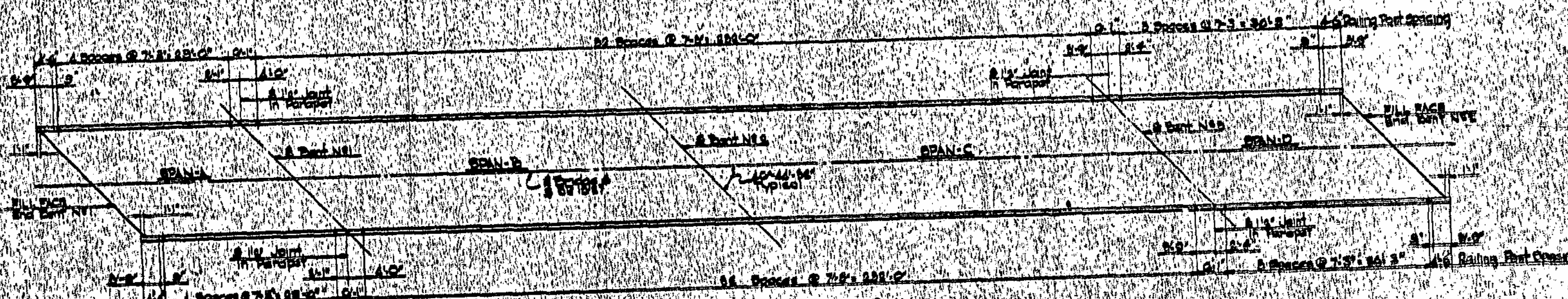
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

S. R. 1527 UNDERPASS
SUPERSTRUCTURE
FRAMING PLAN

REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			SHEET NO. S-46
2			4			TOTAL SHEETS 76

4	N. C.	8.1161706
F. A. PROJECT I-95-3 (38) 139		





RAILING POST SPACING PLAN
RAILING PAY LENGTH = 621.83 L.F.

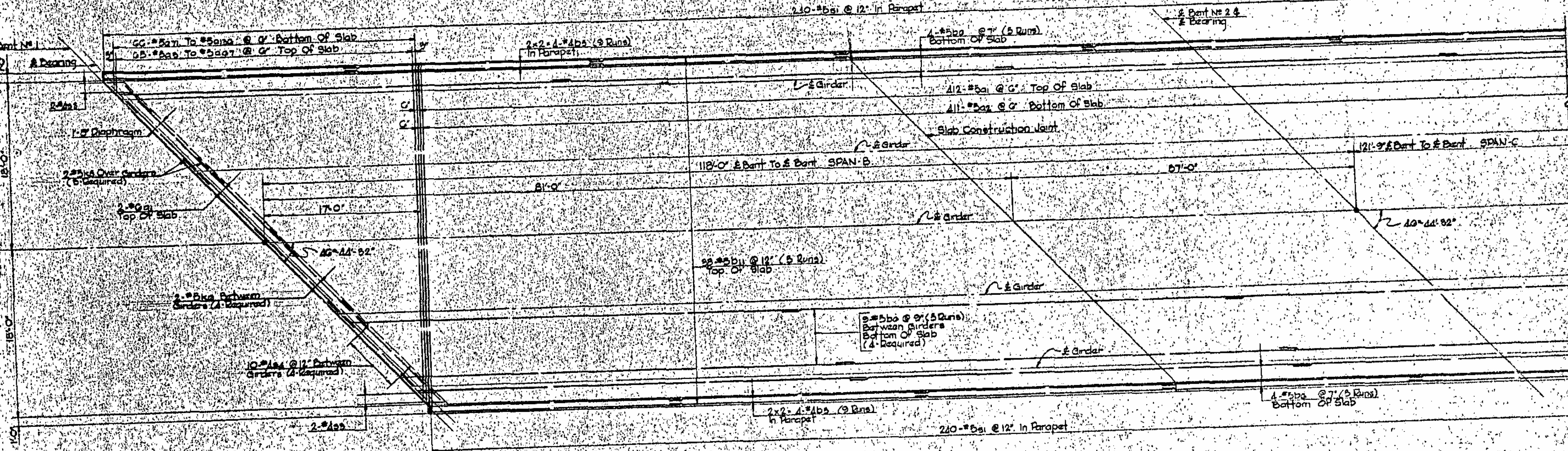
PROJECT NO. 8.1161706
NASH **COUNTY**
STATION: 23+49.43 R2 I-95 = 22+34.06 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
S. R. 1527 UNDERPASS
SUPERSTRUCTURE
DECK PLAN SPANS A & D

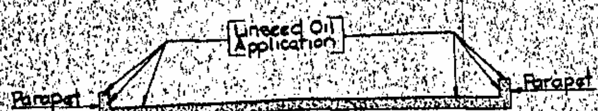
RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. S-47
1			3			TOTAL SHEETS 76
2			4			

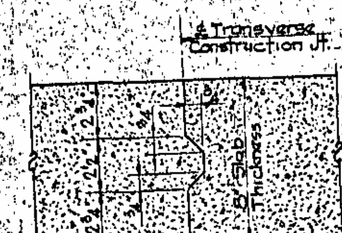
4	N.C.	8.1161706
F.A. PROJECT I-95-3(37)139		



SPAN-B



SKETCH SHOWING LIMIT OF LINSEED OIL APPLICATION



NOTE:
Reinforcing Steel Not Shown. Longitudinal And Transverse Reinforcing Steel Shall Be Continuous Thru Joint.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

PROJECT No. 8.11617

NASH COUNTY

STATION: 2349+43.62 I-95
22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

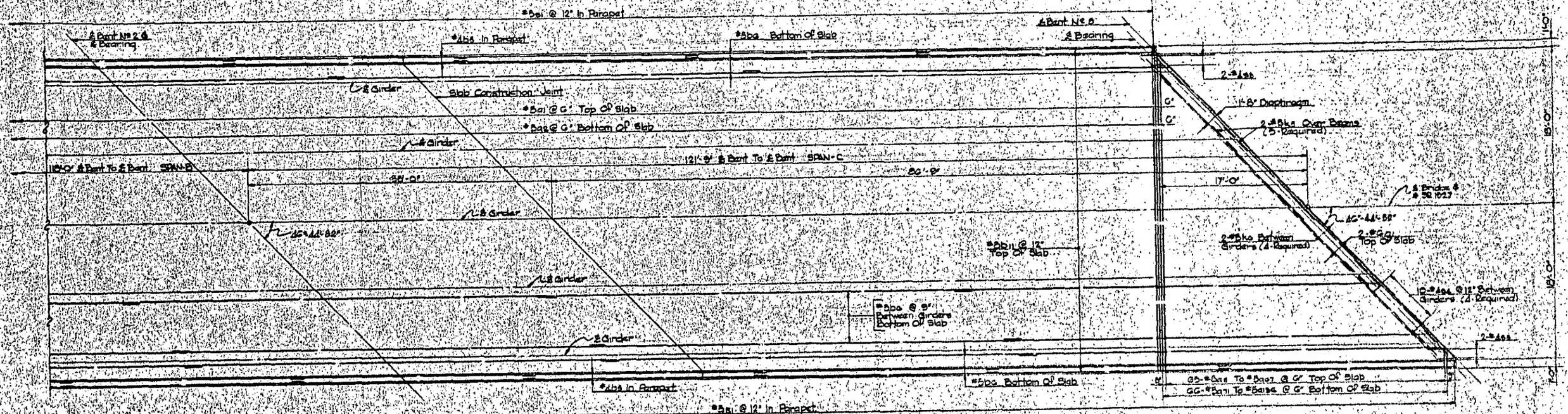
S. R. 1527 UNDERPASS
SUPERSTRUCTURE
DECK PLAN SPAN B

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-49
1			3			TOTAL SHEETS
2			4			76

PROJ. NO.	STATE	PROJECT NO.
4	N.C.	8.1161706

F. A. PROJECT X-95-3(36)139



SPAN - C

PROJECT NO. 8.1161706

NASH COUNTY

STATION: 2349+43.62 I-95 ℄
22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

S. R. 1527 UNDERPASS

SUPERSTRUCTURE

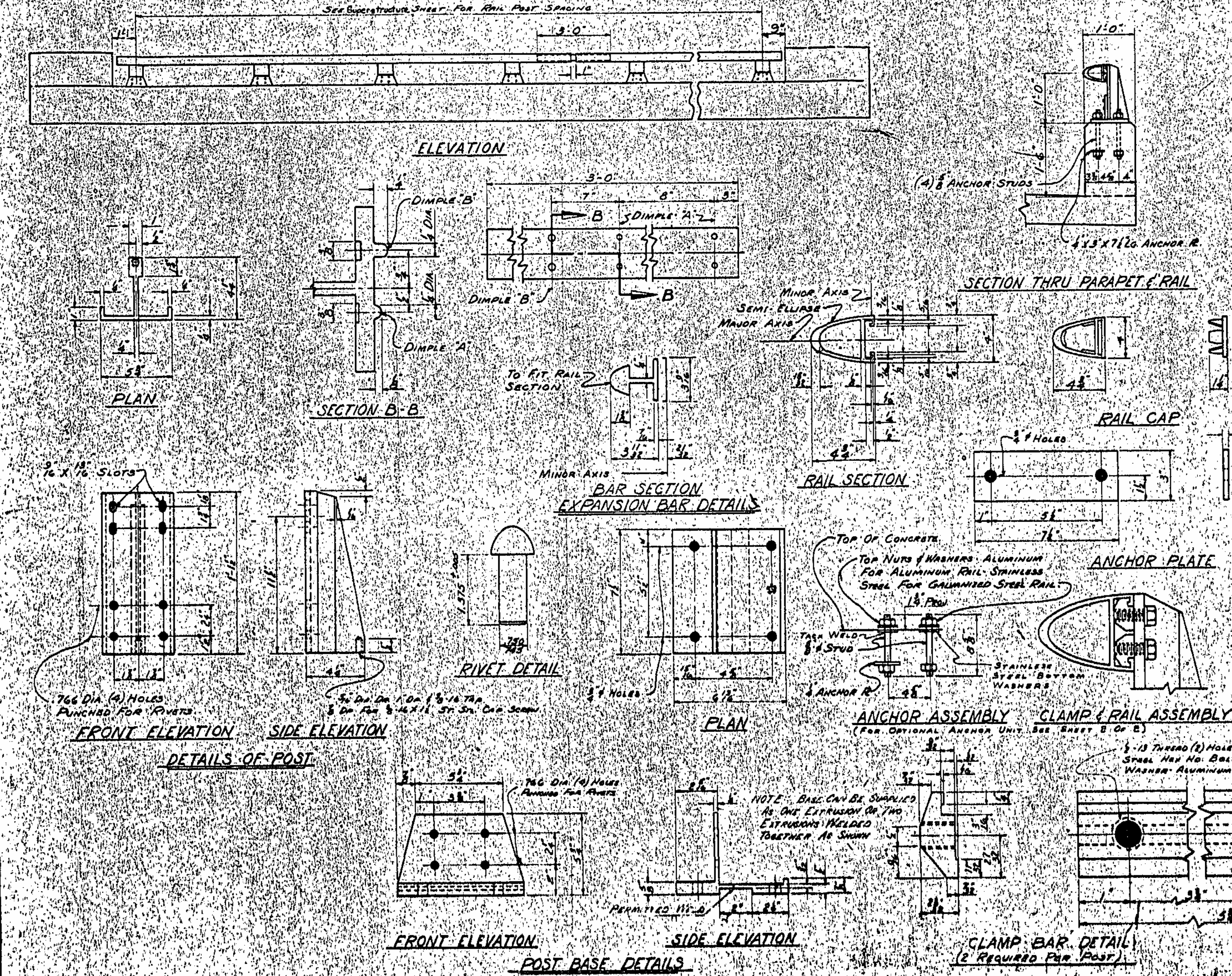
DECK PLAN SPAN C

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-49
1.			3.			TOTAL SHEETS
2.			4.			76

Fed. Road Div. No.	State	Project No.
4	N. C.	8.1161706

F. A. PROJECT I-95-3(38)137



AT THE CONTRACTORS OPTION METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES & RAILS, EXPANSION BARS, & CLAMP BARS SHALL BE A.S.T.M. B-221 ALLOY 6061-T6

MATERIAL FOR ALUMINUM WASHER SHALL BE A.S.T.M. B-209 ALLOY ALCLAD 2024-T3.

MATERIAL FOR RIVETS SHALL BE A.S.T.M. B316 ALLOY 6061-T6 RIVETS SHALL BE STD. BUTTON HEAD & CONE POINT COLD DRIVEN AS PER DRAWING.

MATERIAL FOR ALUMINUM NUTS SHALL BE A.S.T.M. B-211 ALLOY 6061-T6

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

Material for shims to be A.S.T.M. B-209 Alloy 6061-T6

GALVANIZED STEEL RAILS

MATERIALS AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS.

POSTS, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: A.S.T.M. A36 GRADE STRUCTURAL STEEL – GALVANIZED TO A.S.T.M. A-123.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF A.S.T.M. A502 FOR GRADE 1 RIVETS.

NUTS & WASHERS FOR TOP END OF ANCHOR ASSEMBLY FOR STEEL RAIL SHALL BE TYPE 430 STAINLESS STEEL.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH, SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE I OR OF FEDERAL SPECIFICATION TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE C OR A611 FOR GRADE C, AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

CLOSURE PLATES: CLOSURE PLATES SHALL MEET THE REQUIREMENTS OF ASTM A246 GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM-A123.

PAY LENGTH: 621.88

GENERAL NOTES

1. RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.
2. END OF RAIL TO CLEAR FACE OF CONCRETE END POST BY 1½"±.
3. MATERIAL FOR ANCHOR STUDS SHALL BE TYPE 430 STAINLESS STEEL WITH MINIMUM 70,000 P.S.I. ULTIMATE STRENGTH. STUDS TO BE EMBEDDED 7" IN CONCRETE. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREAD. ANCHOR PLATES SHALL BE A.S.T.M. A-36. MACHINE SCREWS FOR RAIL ATTACHMENT SHALL BE TYPE 430 STAINLESS STEEL.
4. CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS & POSTS. SHOP INSPECTION IS NOT REQUIRED.
5. METAL RAIL POSTS TO BE SET NORMAL TO CURB GRADE.
6. METHOD OF MEASUREMENT FOR METAL RAIL: FOR LENGTH OF METAL RAIL TO BE PAID FOR SEE THE 1972 STANDARD SPECIFICATIONS SUB ARTICLE 460-4 (A)
7. CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE, THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.
8. To insure future identification of the Fabricator, a permanent identifying mark shall be placed on each post. The method of marking and location shall be such that it does not detract from the appearance of the post.
9. Shims to be used as necessary for post alignment.
10. Alloy 6351-T5 may be substituted for Alloy 6061-T6 where applicable

PROJECT NO. 8.1161706

NASH **COUNTY**

STATION: 2349+43.82 I-95
22+34.05 S.R. 1527

NOTE: MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

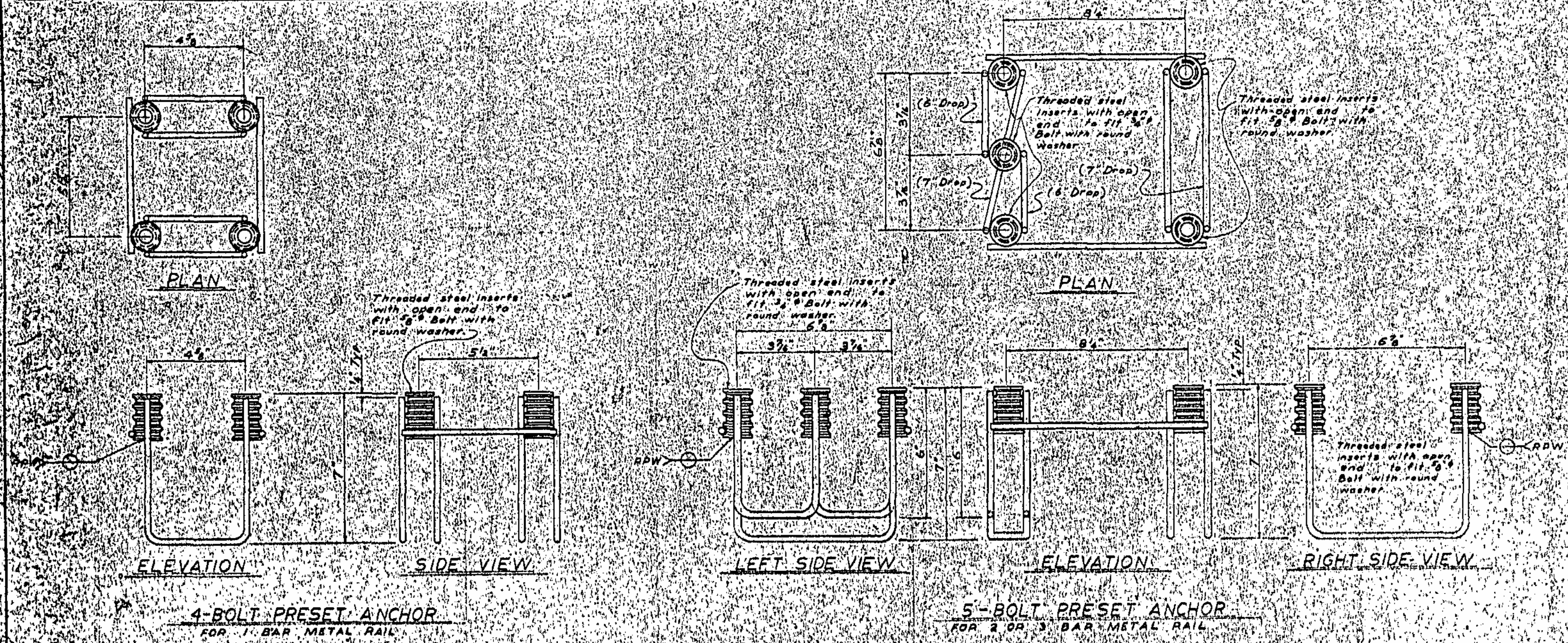
Sheet 1 of 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

STANDARD
I BAR
METAL RAIL

JULY 1964

DRAWN BY [signature] DATE



GENERAL NOTES

This Preset Anchor Assembly may be used in lieu of the anchorage shown on the Standard Metal Rail Sheet.

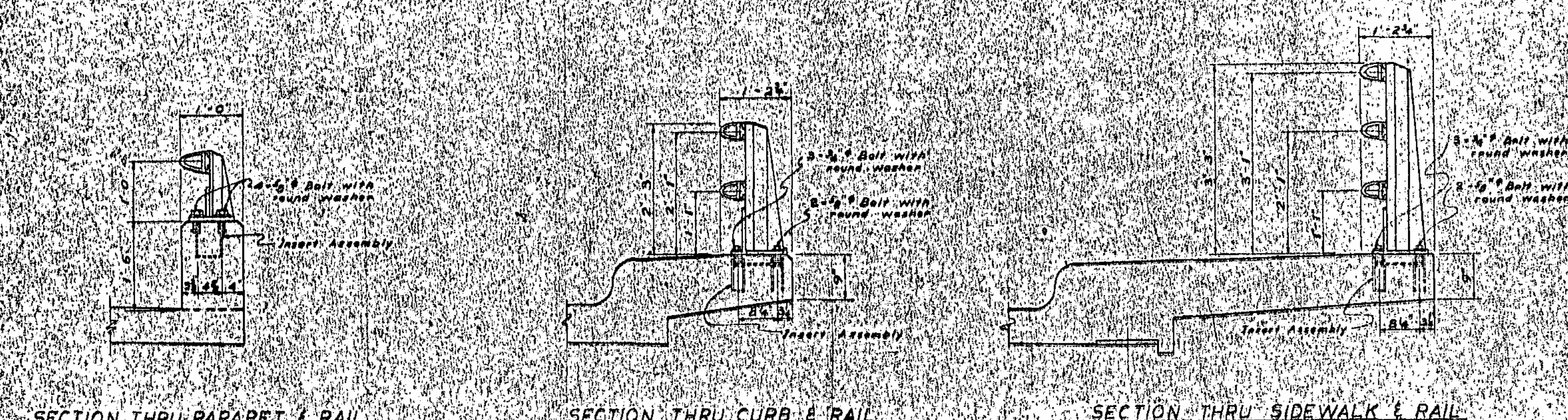
The cost of the Preset Anchor Assembly with bolts and washers complete in place shall be included in the price bid for Lin. Ft. Metal Rail.

The wire gage and threaded steel inserts to be of sufficient strength to insure load anchoring capacity as specified in the AASHO Specifications.

The Preset Anchor Units to be hot dipped galvanized to conform to requirements of A.S.T.M. A123.

Anchor Bolts to be either high tensile steel conforming to A.S.T.M. A449 and galvanized to conform to A.S.T.M. 153, or stainless steel Type 430 with a minimum 70,000 p.s.i. ultimate strength.

Bolts to be tightened one-half turn with the wrench from a finger-tight position.



Revision No. 1: Revised to change Preset Anchor for 1 Bar Metal Rail 2-4-71 By J.A.J. ✓By J.L.S.

Revision No. 2: Revised to change note concerning tightening of bolts 3-15-71 By J.A.J. ✓By J.L.S.

Revision No. 3: Revised to change weld symbol 3-19-71 By J.A.J. ✓By J.L.S.

PROJECT NO. 8.116170

NASH COUNTY

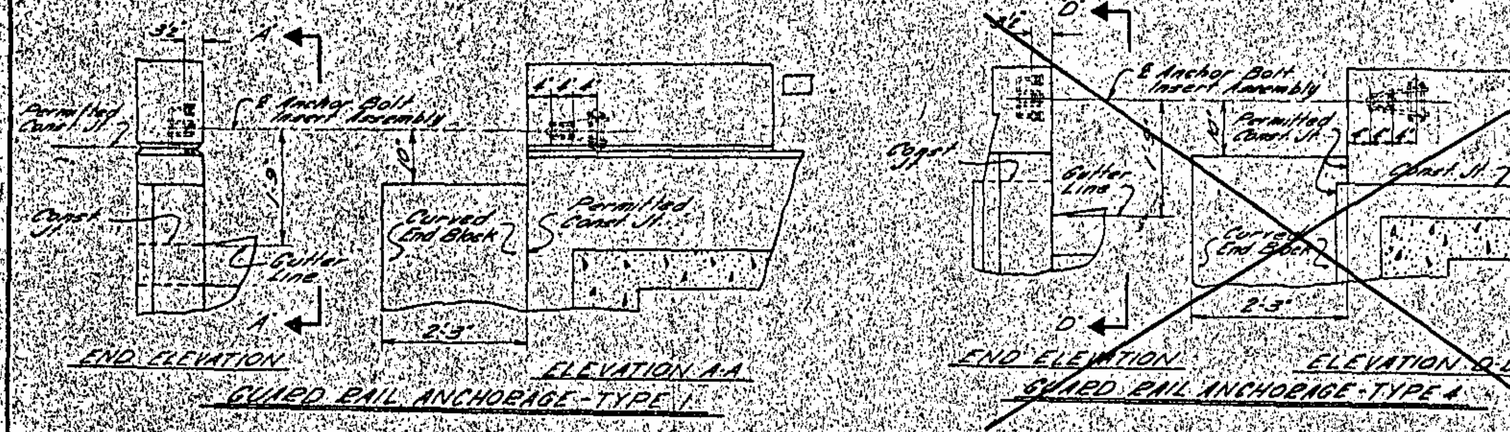
STATION: 2340+43.02 I-95
20+41.05 S.R. 1527

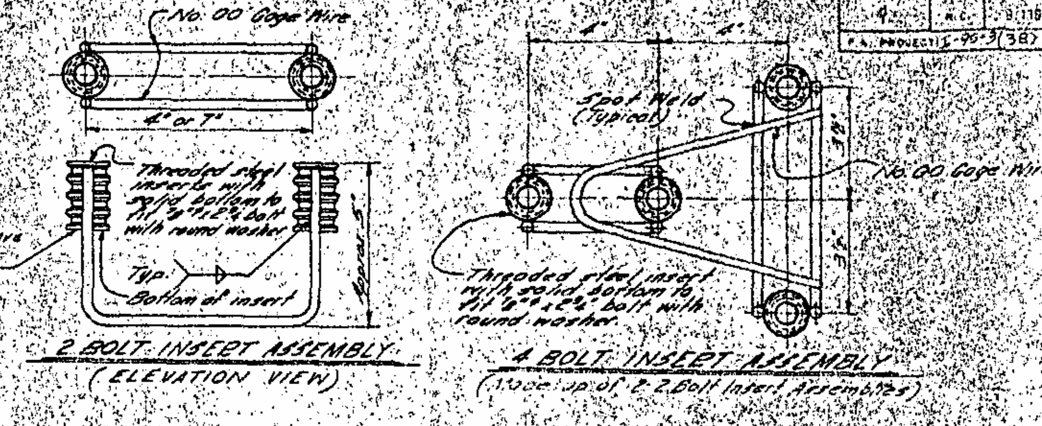
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

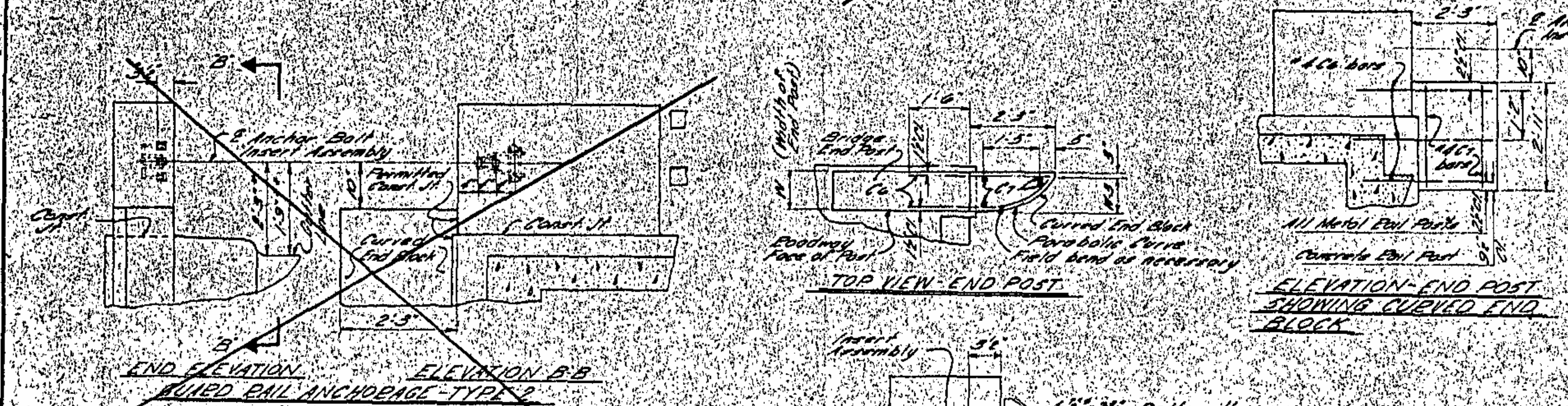
STANDARD
METAL RAIL
OPTIONAL PRESET
ANCHOR UNITS

DECEMBER 1970

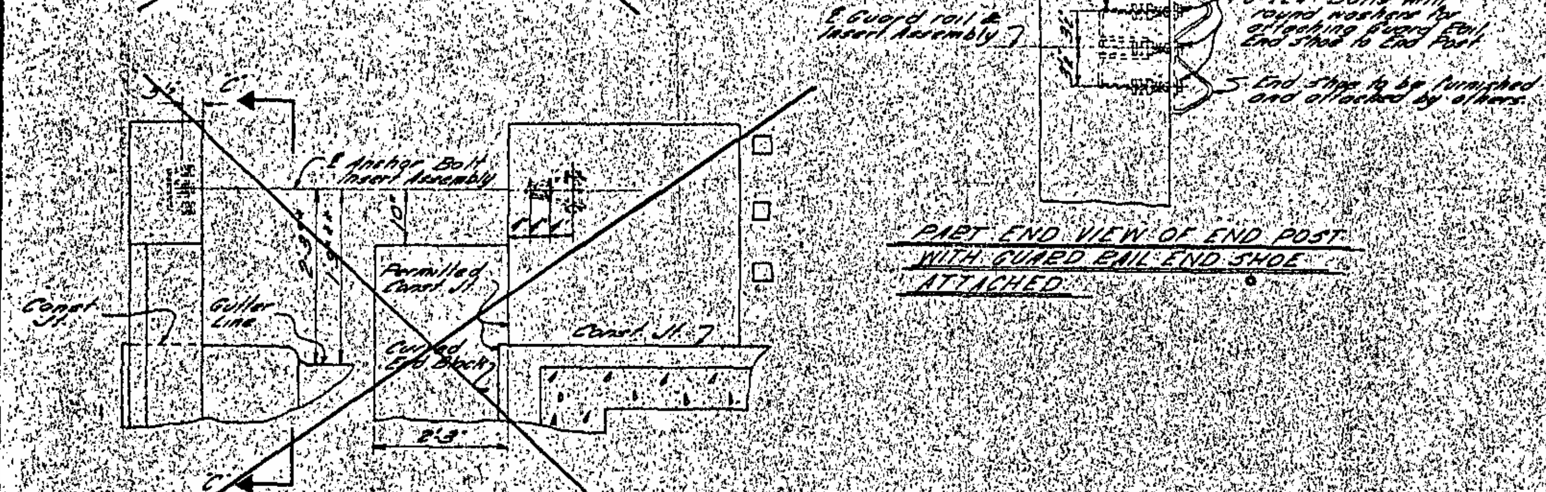
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE







BILL OF MATERIAL FOR 1-CURVED END BLOCK					
	Bar	No.	Size	Length	Weight
	C6	6	#4	3'-7"	14
	C7	4	#4	2'-7"	7
Quantities for 4 Curved End Blocks	Reinforcing Steel				85 Lbs.
	Class "AA" Concrete				.8 C.Y.



2'-3"* For 6" Curb & Gutter approaching bridge when offset distance from bridge end post to face of curb is over 9".

1'-9"** For no Curb & Gutter and 6" Curb & Gutter approaching bridge when offset distance from bridge end post to face of curb is 9" or less.

NOTE: GUARD RAIL ANCHORAGE AND CURVED END BLOCKS ARE TO BE CAST AT ALL END POSTS.

GENERAL NOTES

The cost of the 4 Bolt Insert Assembly Unit consisting of the Insert Assembly and 4 ⅞"ø×2½" bolts with washers complete in place shall be included in the unit contract price bid for Class "AA" Concrete.

The excavation and backfill for curved end block will not be measured or paid for as a separate item. The entire cost of this work shall be included in the unit price bid for Class "AA" Concrete.

The anchor unit shall be assembled in the shop. Bolt threads may be recut as necessary to insure fit.

The ⅞" bolts and washers shall conform to the requirements of A.S.T.M. A307 and shall be galvanized to conform to the requirements of A.S.T.M. A153.

At the contractors option stainless steel bolts and washers may be used as an alternate for the ⅞" galvanized bolts and washers. They shall conform to or exceed the mechanical requirements of A.S.T.M. A307. The use of this alternate shall be approved by the Engineer.

The threaded steel inserts shall conform to the requirements of A.S.T.M. A108 with a minimum tensile strength of 60000 psi.

PROJECT No. 8.1161700

NASH COUNTY

STATION: 2099+93.82 I-95
28+34.05 S.R. 1527

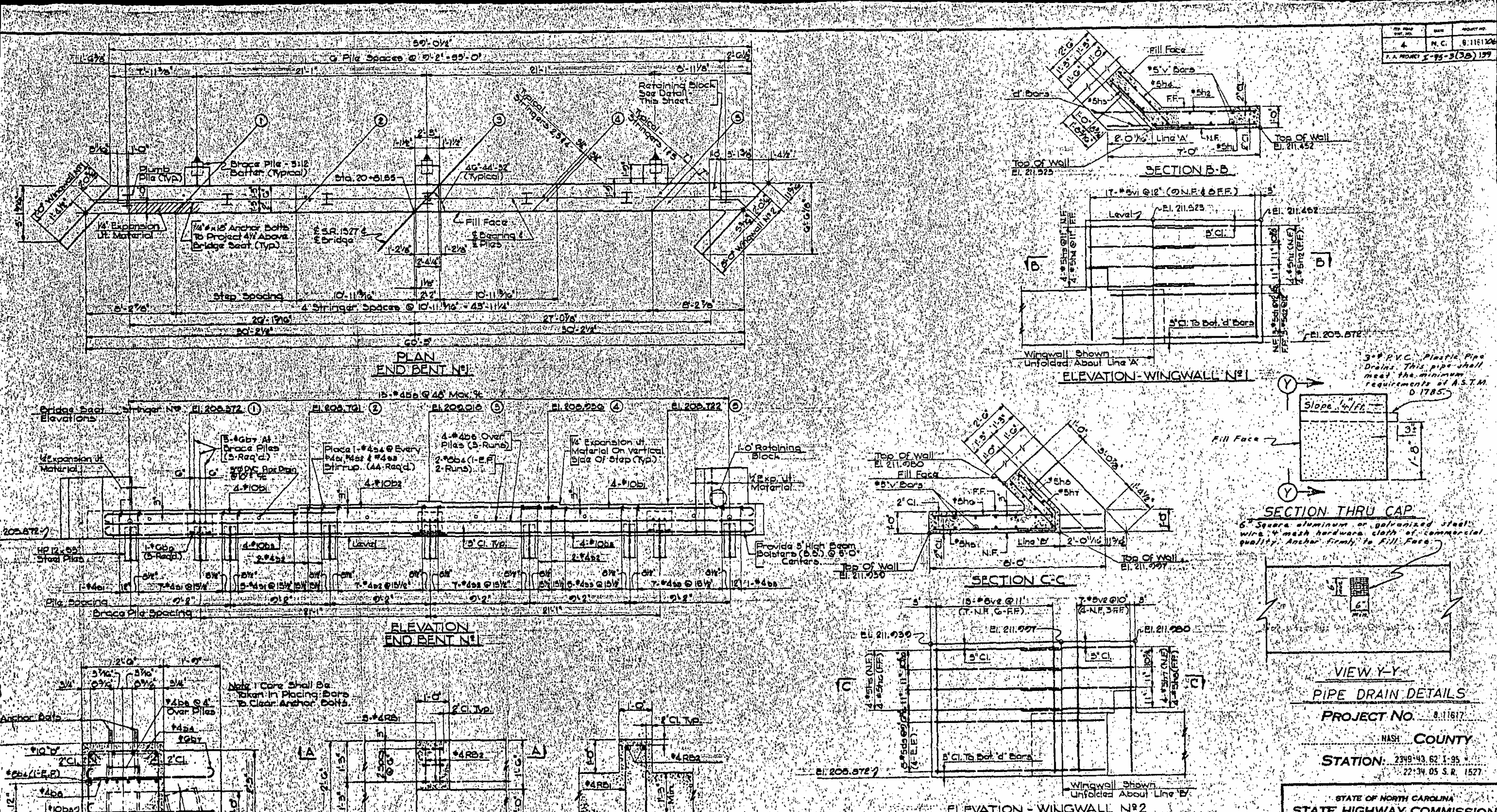
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

STANDARD GUARD RAIL ANCHORAGE FOR BRIDGE END POST

OCTOBER, 1970

REVISIONS

ASSEMBLED BY
CHECKED BY



Note: No separate payment will be made for furnishing and installing the P.V.C. plastic pipe drains, hardware cloth and fasteners. The entire cost of this work shall be included in the unit contract price bid for the several pay items.

For Pile splice details, See End Bent No. 2.

For bill of Material, See End Bent No. 2.

Note:
N.F. Denotes Near Face.
F.F. Denotes Far Face.
E.F. Denotes Each Face.

PROJECT NO. 8.11617

NASH COUNTY

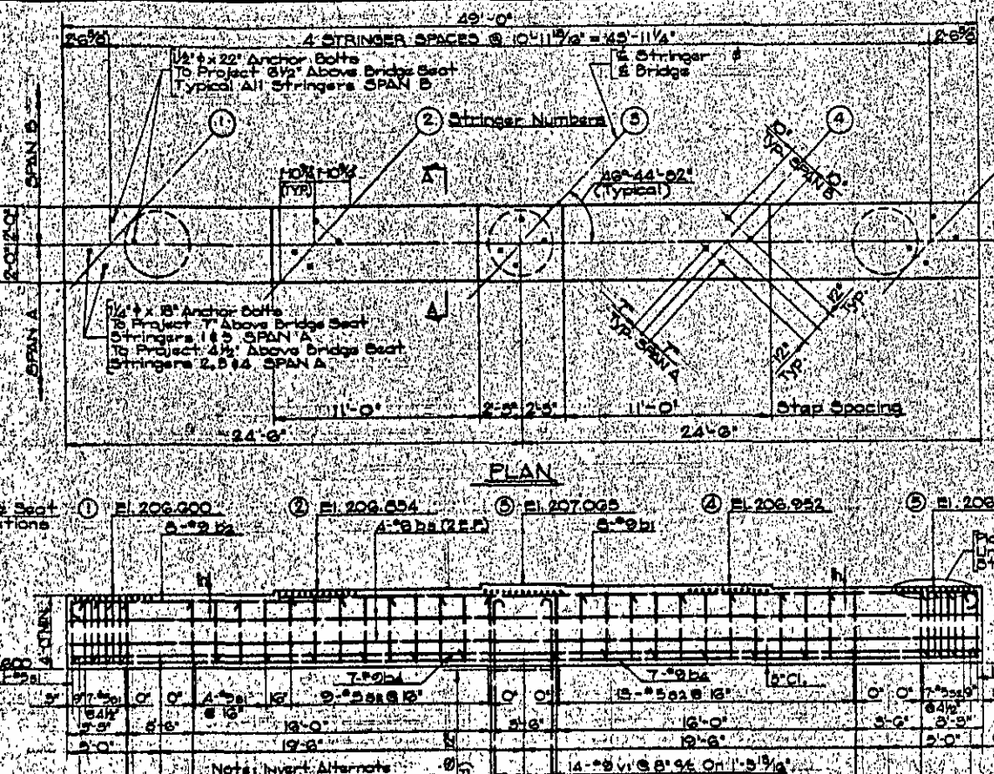
STATION: 2349+43.62 I-95 = 22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

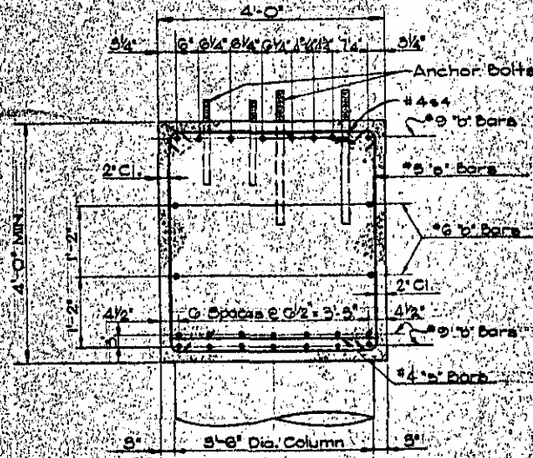
S. R. 1527 UNDERPASS
SUBSTRUCTURE
END BENT NO. 1

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-53



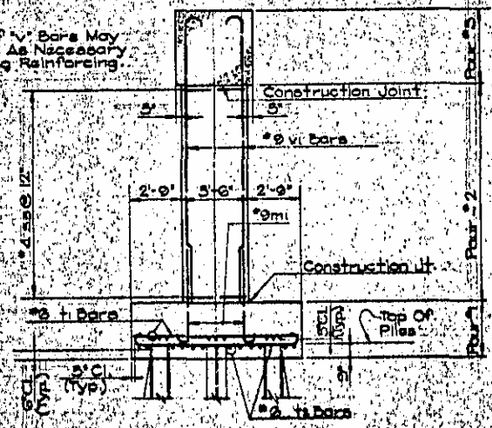
Note: Care Shall Be Taken In Placing Bars To Clear Anchor Bolts



SECTION A-A

Note: Provide 5" High Beam Bolsters (B.B.) @ 5'-0" Bottom "b" Bars

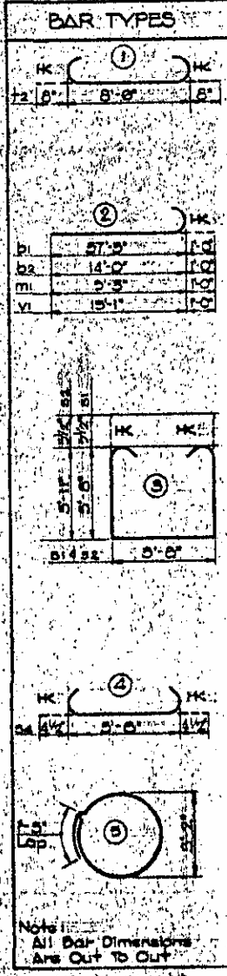
Note: Hooks Of "v" Bars May Be Turned As Necessary For Placing Reinforcing



TYPICAL SECTION

Note: For Pile Splice Details, See End Bent #2

BAR TYPES



BILL OF MATERIAL

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
b1	5	#9	2	58'-3"	1,040
b2	8	#9	2	15'-0"	408
b3	4	#6	St+	48'-6"	291
b4	14	#9	St+	48'-6"	2,500
m1	42	#9	2	6'-3"	552
b1	12	#5	S	11'-11"	149
s2	50	#5	S	12'-5"	585
s3	56	#4	S	11'-3"	271
s4	60	#4	4	4'-5"	192
s5	15	#4	Stn	5'-0"	33
t1	54	#6	St+	8'-6"	689
t2	72	#6	1	9'-10"	1065
v1	42	#9	2	18'-1"	2297
Reinforcing Steel				Lbs.	10,025
HP 12x53 Steel Piles				No.	27
				L.F.	1458

CLASS 'A' CONCRETE BREAKDOWN		
Pour No 1 Footing	C.Y.	26.5
Pour No 2 Columns	C.Y.	12.4
Pour No 3 Cap	C.Y.	24.5
TOTAL	C.Y.	63.0

	4.	N. C.	8.1161706
	F. A. PROJECT S-96-3(58) 139		

PROJECT NO. 8.1161706

NASH COUNTY

STATION: 2349+43.62 I-95 = /
22+74.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

S. R. 1527 UNDERPASS

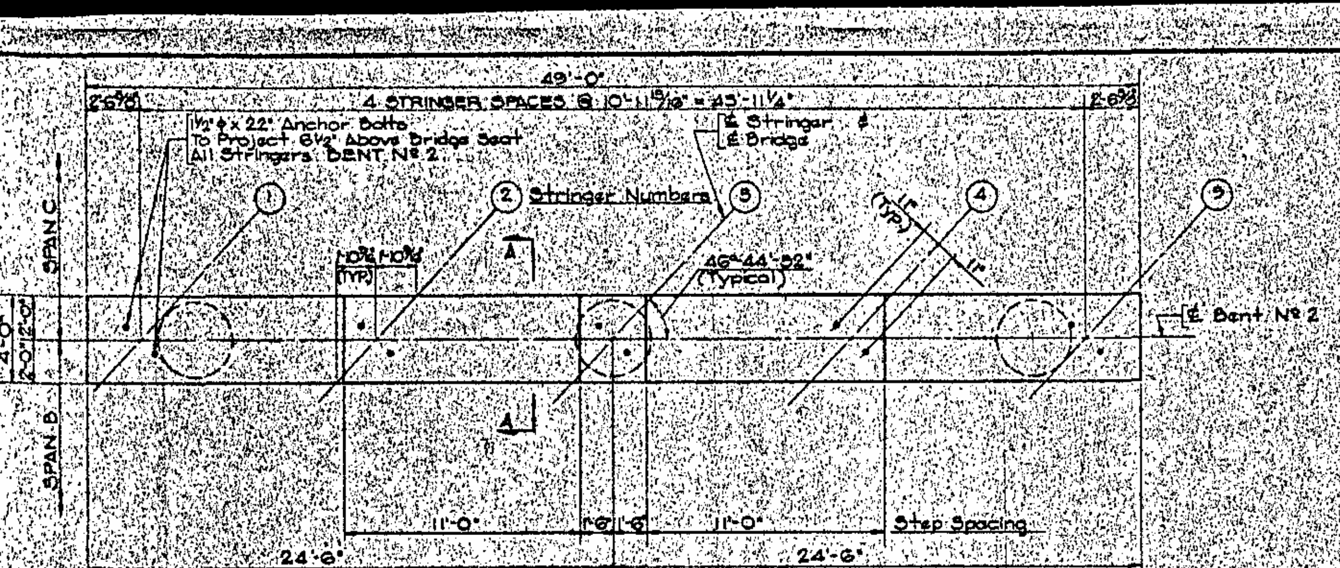
SUBSTRUCTURE

BENT NO. 1

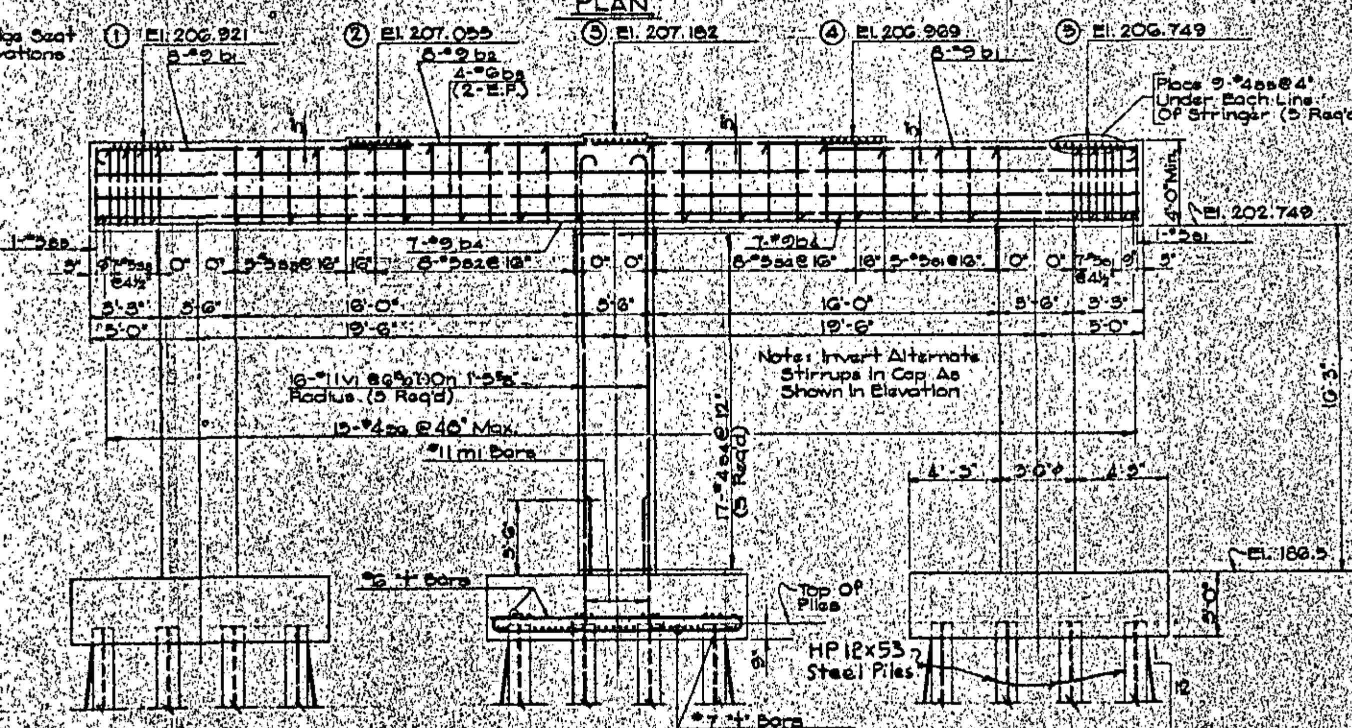
RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-56

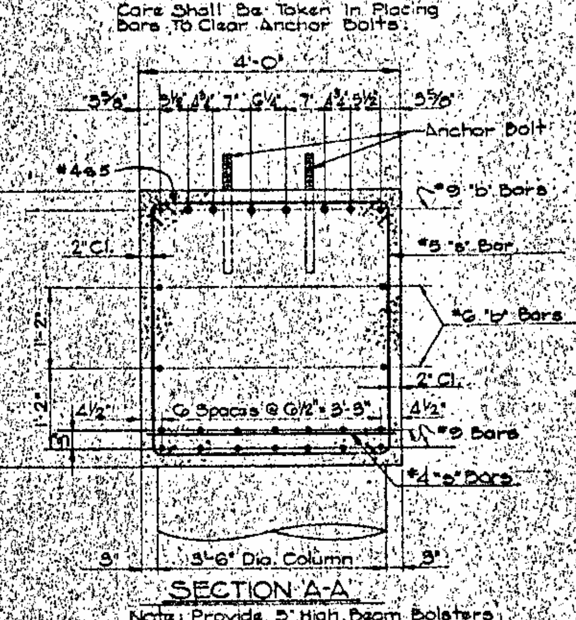
4	N.C.	8.116170
	I-95-3(38) 139	



PLAN



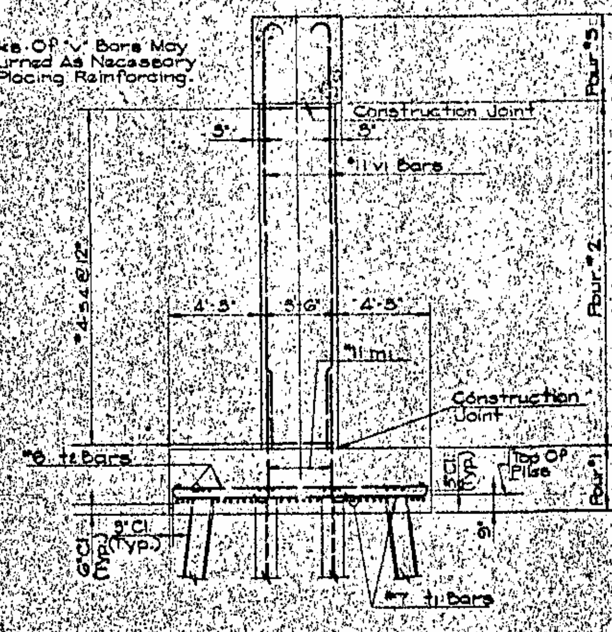
ELEVATION



SECTION A-A

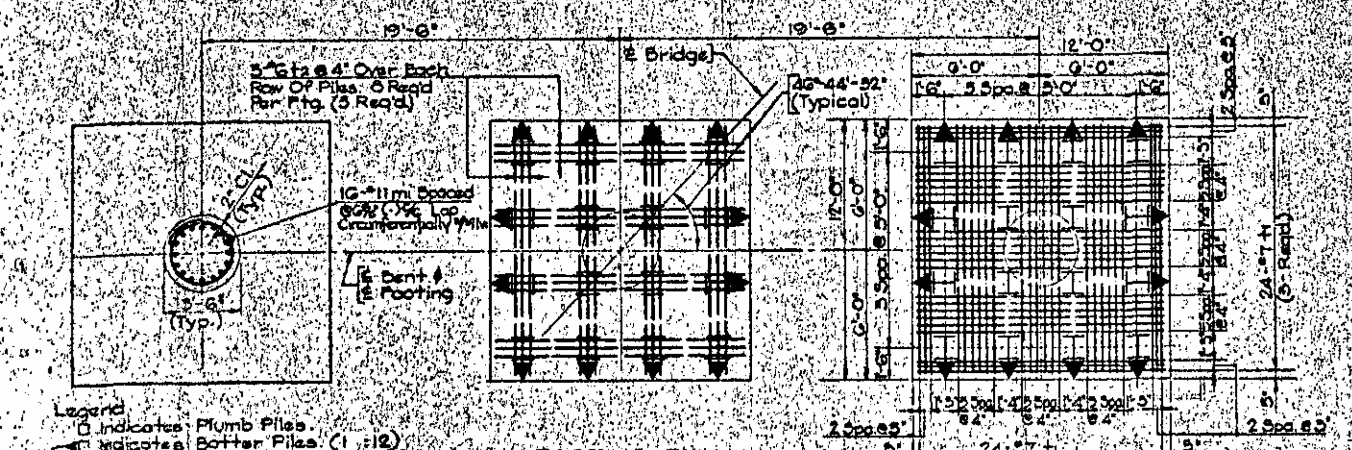
Note: Provide 5" High Beam Bolsters (B.B.) @ 5'-0" Bottom "b" Bars

Note: Hooks Of "v" Bars May Be Turned As Necessary For Placing Reinforcing.



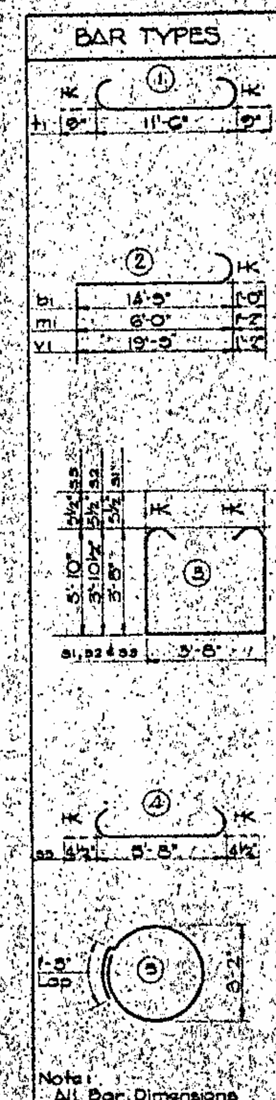
TYPICAL SECTION

Note: For Pile Splice Details, See End Bent #2



Legend:
□ Indicates Plumb Piles.
Indicates Batter Piles (1:12)

BAR TYPES



Note:
All Bar Dimensions Are Out To Out

BILL OF MATERIAL

BAR	Nº	SIZE	TYPE	LENGTH	WEIGHT
b1	16	#9	②	15'-9"	857
b2	8	#9	Str.	24'-6"	666
b3	4	#6	Str.	48'-6"	291
b4	14	#9	Str.	48'-6"	2,309
m1	48	#11	②	7'-2"	1,828
s1	19	#5	③	11'-11"	162
s2	16	#5	③	12'-4"	206
s3	13	#5	③	12'-8"	169
s4	51	#4	③	11'-3"	383
s5	45	#4	④	4'-5"	133
s6	13	#4	Str.	3'-9"	33
t1	144	#7	①	13'-0"	3,826
t2	72	#6	Str.	11'-6"	1,244
v1	46	#11	②	20'-11"	5,334

Reinforcing Steel	Lbs.	17,438
HP 12x53 Steel Piles	Nº	48
	L.F.	2,370

CLASS A CONCRETE BREAKDOWN		
Pour Nº1 Footing	C.Y.	47.5
Pour Nº2 Columns	C.Y.	17.4
Pour Nº3 Cap	C.Y.	26.8
TOTAL	C.Y.	91.7

PROJECT NO. 8.1161706

NASH COUNTY

STATION: 2349+43.62 I-95
22+34.05 S.R. 1527

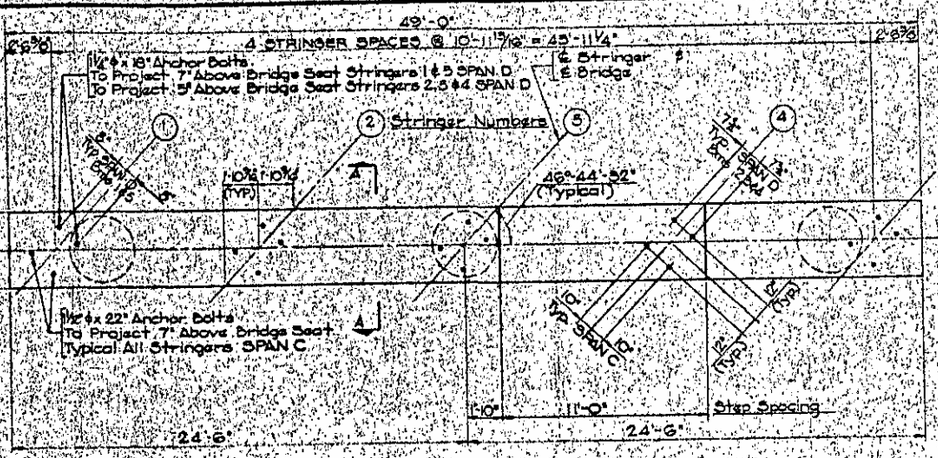
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

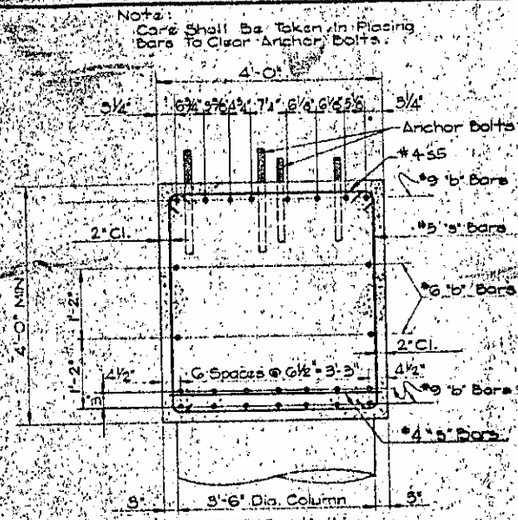
S. R. 1527 UNDERPASS
SUBSTRUCTURE
BENT NO. 2

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS

REVISIONS

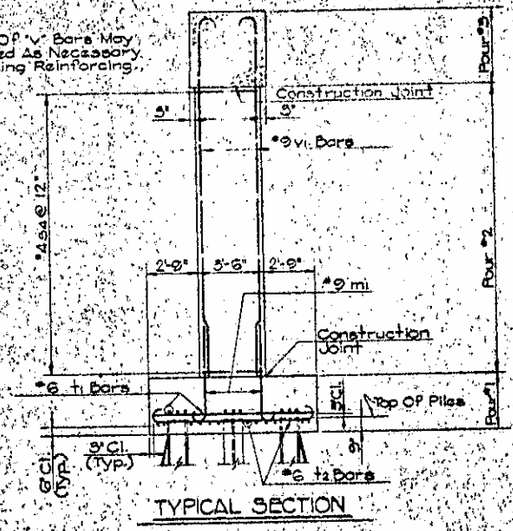
S-5





SECTION 'A-A'

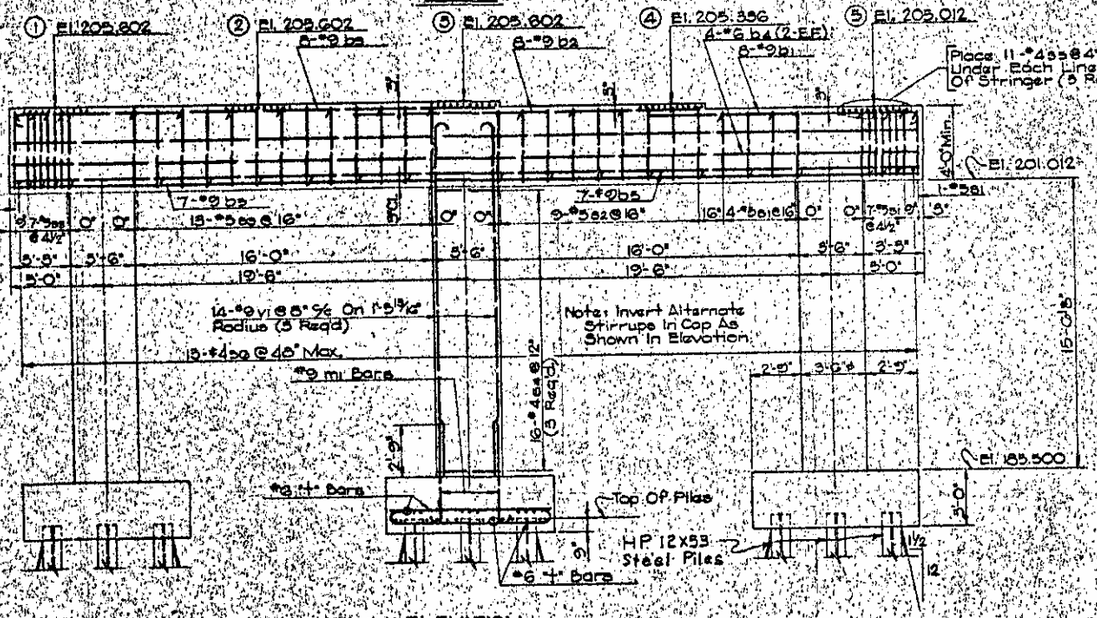
Note: Provide 5" High Beam Bolsters (B.B.) @ 5'-0" Bottom 'b' Bars.



TYPICAL SECTION

Note: For Pile Splice Details, See End Bent #2

PLAN



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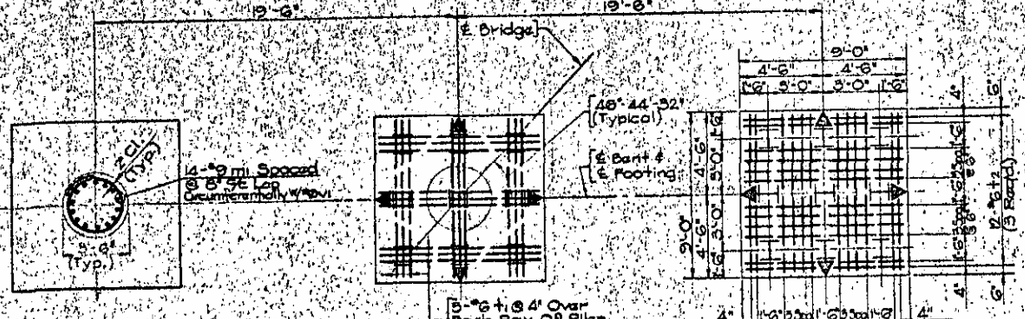
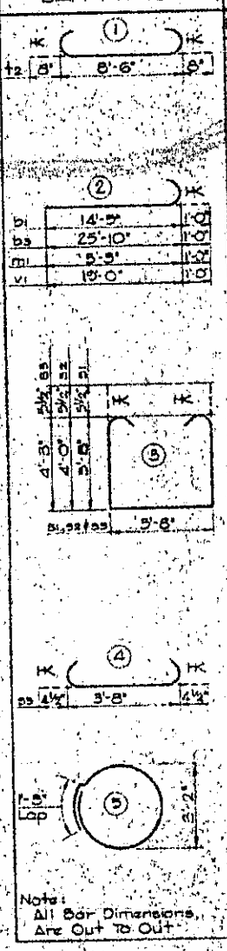


Legend

BAR TYPES



Note: All Bar Dimensions Are Out To Out

BILL OF MATERIAL

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
b1	8	#9	2	19'-5"	412
b2	8	#9	Str.	16'-5"	301
b3	8	#9	2	20'-0"	730
b4	4	#6	Str.	48'-6"	291
b5	14	#9	Str.	48'-8"	2,502
mi	42	#9	2	6'-8"	893
s1	12	#5	5	11'-11"	149
s2	9	#5	5	12'-7"	118
s3	21	#5	5	19'-1"	267
s4	48	#4	5	11'-3"	351
s5	99	#4	4	4'-9"	632
s6	15	#4	Str.	3'-0"	33
t1	54	#6	Str.	8'-8"	292
t2	72	#6	1	5'-10"	1,053
v1	42	#9	2	20'-0"	2,856
Reinforcing Steel				Lbs.	10,501
HP 12x53 Steel Piles				No.	27
				L.F.	162

CLASS 'A' CONCRETE BREAKDOWN		
Pour No. 1 Footing	C.Y.	26.6
Pour No. 2 Columns	C.Y.	6.6
Pour No. 3 Cap	C.Y.	8.9
TOTAL	C.Y.	42.1

PROJECT NO. B-1161706

NASH COUNTY

STATION: 22+49.43, 62, L-95
22+74.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

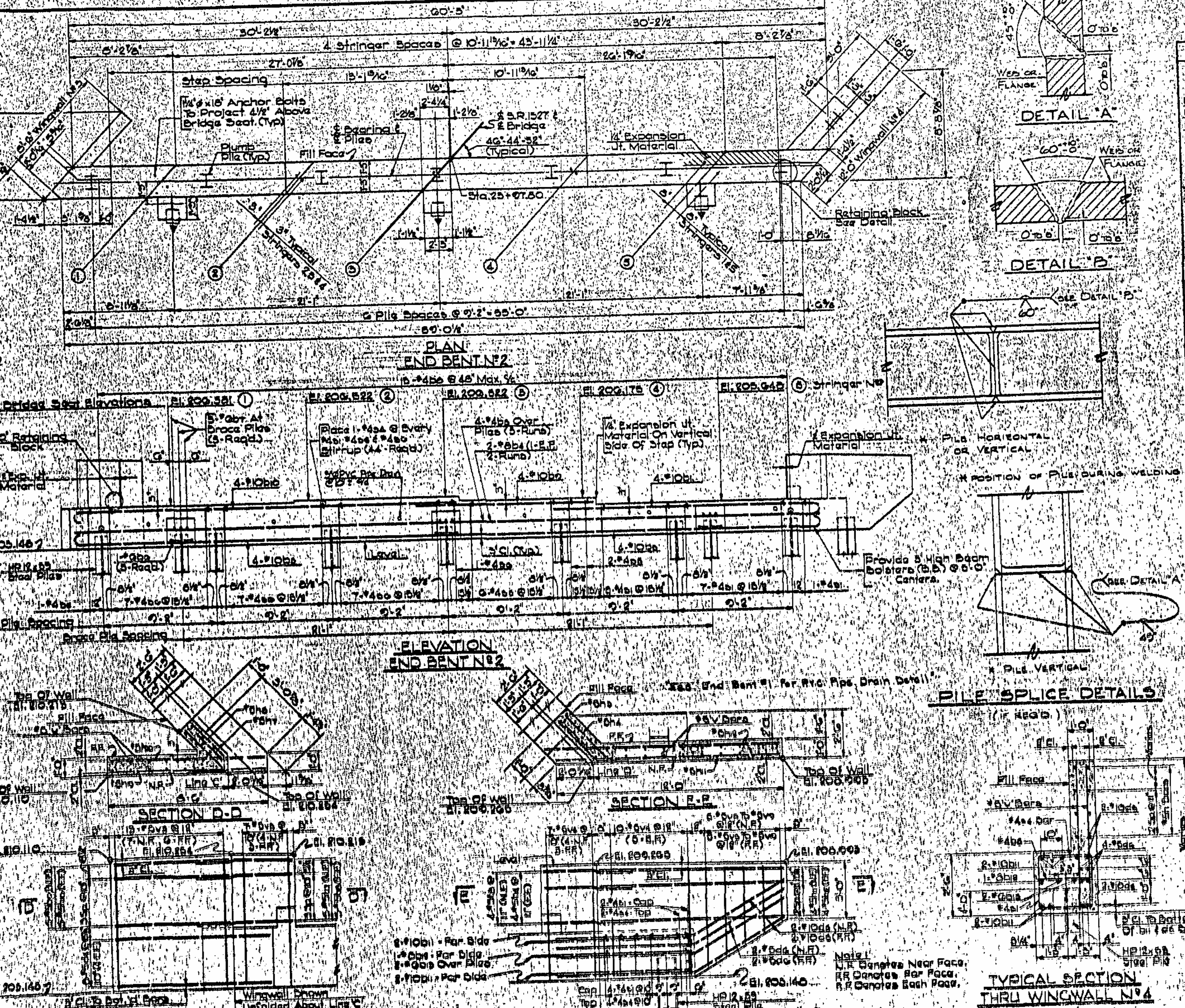
S. R. 1527 UNDERPASS
SUBSTRUCTURE
BENT NO. 3

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS

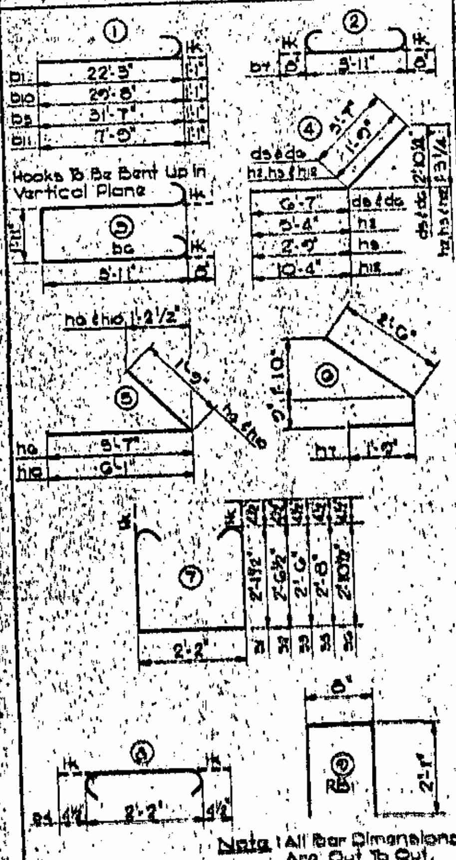
REVISIONS

NO.	BY	DATE	NO.	BY	DATE

S-56



BAR TYPES



BILL OF MATERIAL
END BENTS - Nº 1 & Nº 2

BAR	NUMBER E.B.#1	NUMBER E.B.#2	SIZE	TYPE	LENGTH	WEIGHT E.B.#1	WEIGHT E.B.#2
b1	8	4	#10	1	25'-4"	803	402
b2	4		#10	Str.	23'-10"	410	
b3	8	8	#10	1	32'-8"	1,125	1,125
b4	4	4	#8	Str.	31'-3"	334	334
b5	12	12	#4	Str.	20'-10"	167	167
b6	3	3	#6	3	11'-1"	50	50
b7	9	9	#6	2	3'-3"	71	71
b8	15	15	#4	Str.	8'-2"	22	26
b9		4	#10	Str.	14'-5"		248
b10		4	#10	1	30'-9"		529
b11		4	#10	1	8'-10"		152
b12		1	#8	Str.	8'-6"		23
b13		2	#6	Str.	7'-4"		22
h1	4		#6	Str.	4'-9"	30	
h2	4		#6	4	7'-1"	30	
h3	4	4	#6	4	4'-0"	19	19
h4	4	4	#6	Str.	3'-4"	14	14
h5	4		#6	Str.	6'-7"	26	
h6	4		#6	8	7'-4"	21	
h7	4	8	#6	9	8'-0"	21	26
h8	4	8	#6	Str.	2'-11"	12	16
h9		8	#6	Str.	6'-1"		37
h10		8	#6	6	7'-0"		41
h11		4	#6	Str.	5'-6"		40
h12		4	#6	4	12'-1"		60
s1	15	13	#4	7	7'-8"	98	91
s2	8		#4	7	6'-9"	39	
s3	13		#4	7	7'-11"	69	
s4	44	60	#4	8	2'-11"	86	97
s5		8	#4	7	6'-9"		44
s6		23	#4	7	6'-6"		135
v1	17		#6	Str.	6'-9"	93	
v2	20		#6	Str.	6'-9"	183	
v3		20	#6	Str.	6'-6"		195
v4		17	#6	Str.	6'-6"		100
v5		2	#6	Str.	8'-9"		6
v6		2	#6	Str.	5'-4"		7
v7		2	#6	Str.	3'-11"		5
v8		2	#5	Str.	4'-7"		10
v9		2	#6	Str.	5'-2"		11

BILL OF MATERIAL ~ CONT'D.
END BENTS - Nº 1 & Nº 2

BAR	NUMBER E.B.#1	NUMBER E.B.#2	SIZE	TYPE	LENGTH	WEIGHT E.B.#1	WEIGHT E.B.#2
d1	3		#6	Str.	9'-10"	21	
d2	3		#6	Str.	7'-6"	25	
d3	8		#6	Str.	7'-6"	64	
d4		8	#6	Str.	8'-8"		68
d5		4	#10	4	12'-2"		200
d6		4	#6	4	12'-8"		61
RB1	6	6	#4	9	4'-10"	19	19
RB2	4	4	#4	Str.	1'-2"	3	3
Reinforcing Steel					Lbs.	3,606	4,579
Class 'A' Concrete					C.Y.	29.6	23.9
HP 12 x 53 Steel Piles					Nº	10	11
					L.F.	725	545

PROJECT NO. 8.1161706

NASH **COUNTY**

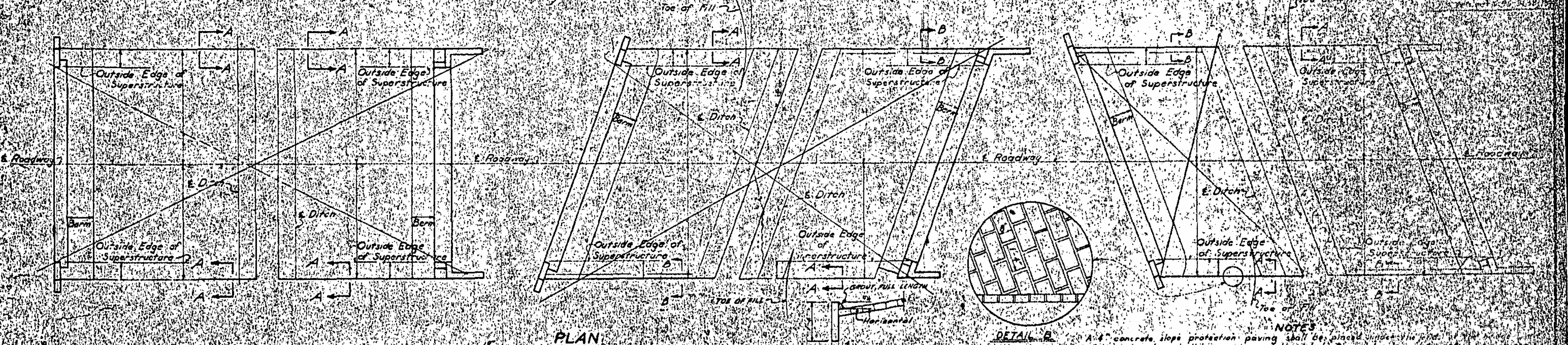
STATION: 2349+43.63 I-95 &
22+34.05 S.R. 1527

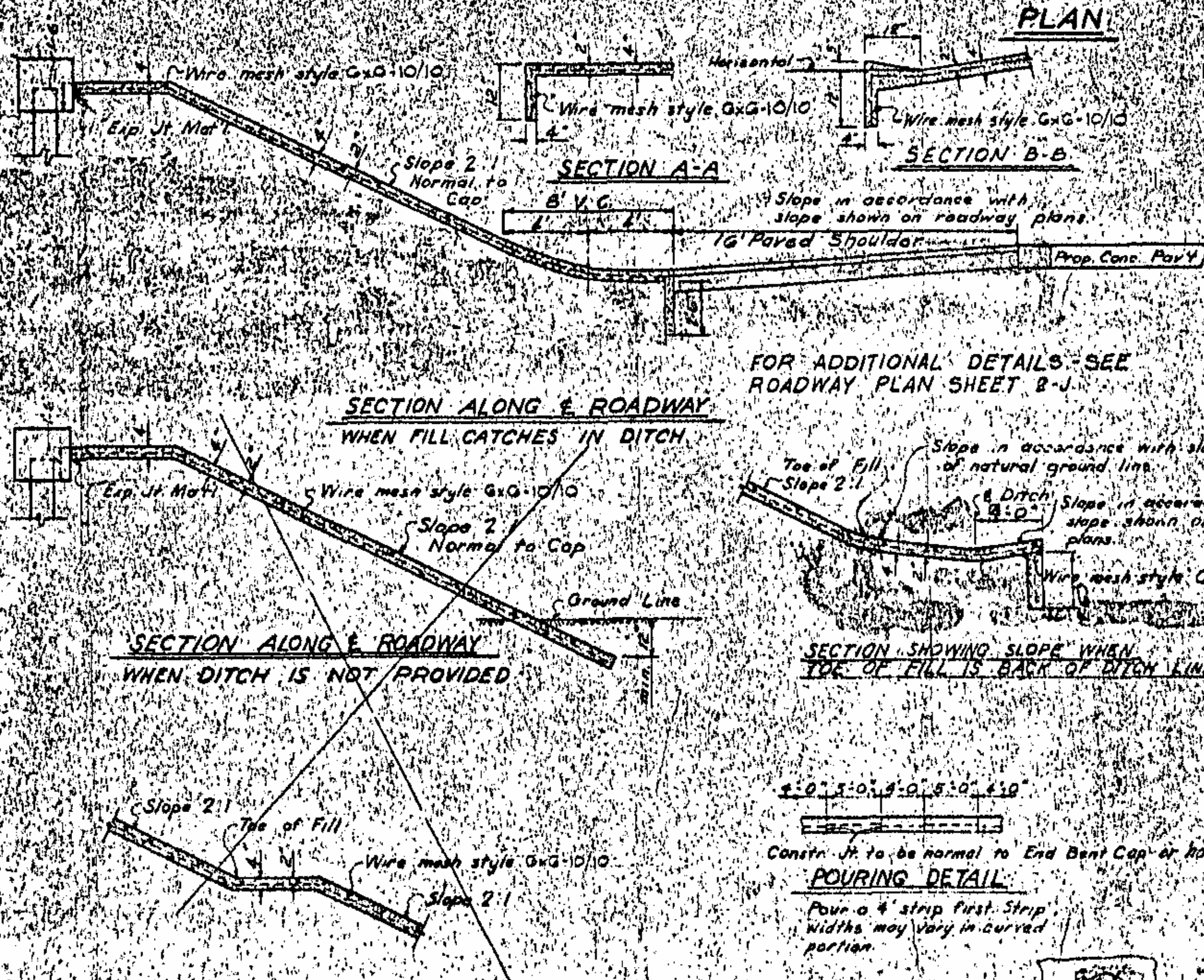
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

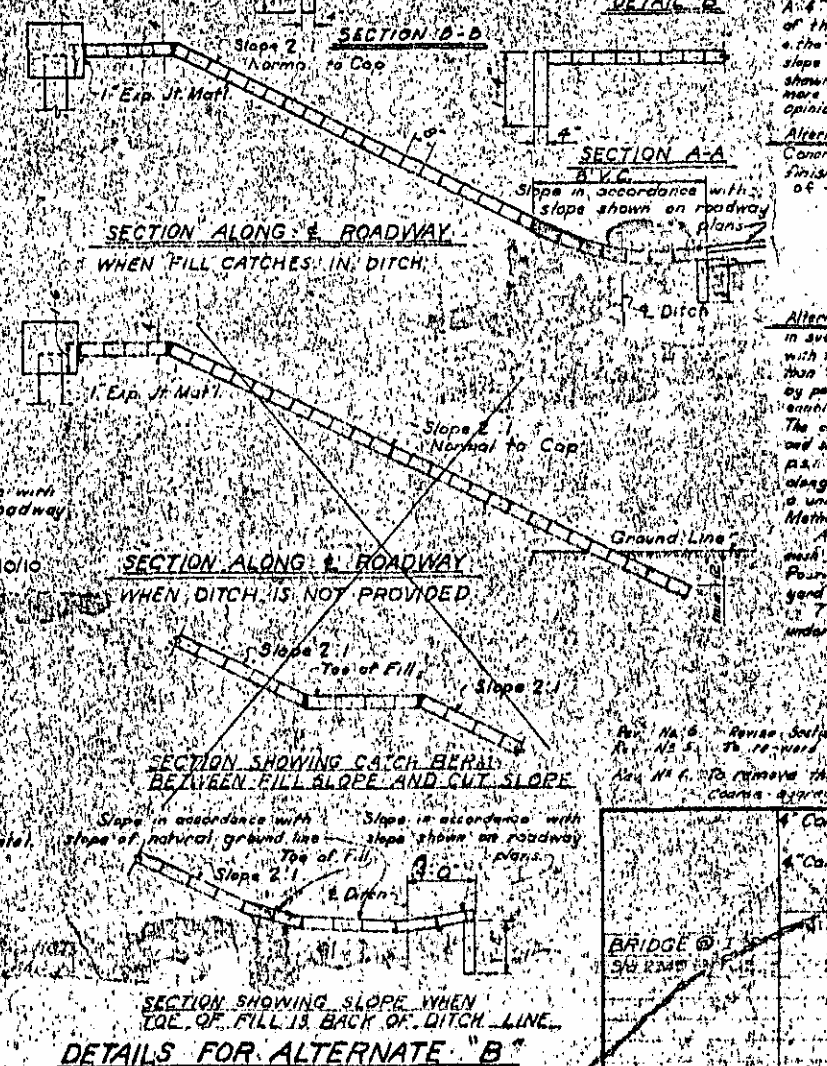
S. R. 1527 UNDERPASS
SUBSTRUCTURE
END BENT NO. 2

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS

REVISIONS







NOTES

A 4" concrete slope protection paving shall be placed under the [illegible] of the protection shall be as shown in the details. The contractor, at his option, may [illegible] either type, Alternate "A" or "B", as described below. Immediately before placing [illegible] slope shall be properly shaped and firmly compacted so that it conforms to the [illegible] shown. The finished surface shall be reasonably smooth and uniform [illegible] more than ¼ inch in a distance of 10 feet. Straight edging will [illegible] opinion of the Engineer visual inspection indicates a need.

Alternate "A" shall consist of 4" poured in place concrete paving [illegible] Concrete shall be Class B. The concrete surface shall be [illegible] finished. Method of Measurement & Basis of Payment [illegible] of the Standard Specifications.

Alternate "B" shall consist of solid concrete blocks [illegible] in successive courses will break joints [illegible] with their long axis parallel to the end bent cap [illegible] than ⅜" nor more than ½" wide between successive courses [illegible] by pouring a mixture of one part Portland cement [illegible] enable the mixture to be poured through a spout.
The concrete blocks shall be cast to accurate dimensions [illegible] and shall be manufactured of materials to produce a [illegible] p.s.i. at age of 28 days. No broken blocks shall be [illegible] along each side of the paving down the slope [illegible] a uniform, workmanlike joint and surface.
Method of measurement and basis of payment shall be [illegible]

ALTERNATE "A" wire mesh reinforcing to be [illegible] mesh to lap at least 6". Slope Protection to be poured [illegible] Pouring Detail. The cost of wire mesh to be included [illegible] yard for 4" concrete slope protection.

The same type of slope protection shall be used under both ends of any one bridge.

DETAILS FOR ALTERNATE "A"

PLAN WHERE CONC. OR CONC. BLOCK SLOPE PROTECT. MUST BE PLACED AROUND A BENT COLUMN.

DETAILS FOR ALTERNATE "B"

Rev. No. 6. Revise Section B-B to show 5" rise from horizontal. By [illegible]
Rev. No. 5. To re-word note regarding surface finish requirements. By [illegible]
Rev. No. 4. To remove that portion of the note calling for Standard size [illegible] Coarse aggregate. By KMH. [illegible]

Rev. No. 3. To eliminate [illegible] at toe of slope [illegible] Sections and Sect. B-B, and to allow alternate for construction jts.

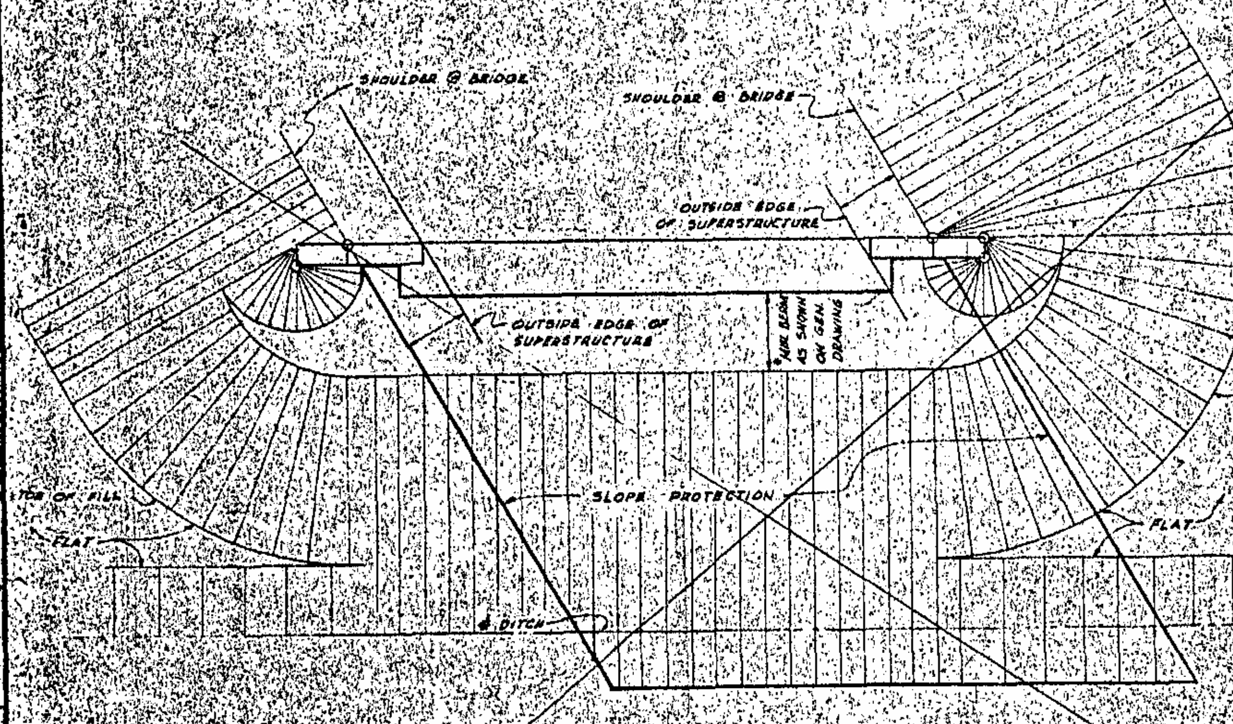
Rev. No. 2. To take out dimensions from outside edge of superstructure to outside slope protection.
Rev. No. 1. To show Berm 1'-6" above bottom of cap. [illegible]

	4" Conc. Slope Protection or 4" Conc. Block Slope Protect. S.Y.		Wire Mesh 60" Wide
	E.B. 1	E.B. 2	Approx. L.F.
BRIDGE @ [illegible]	210	270	085

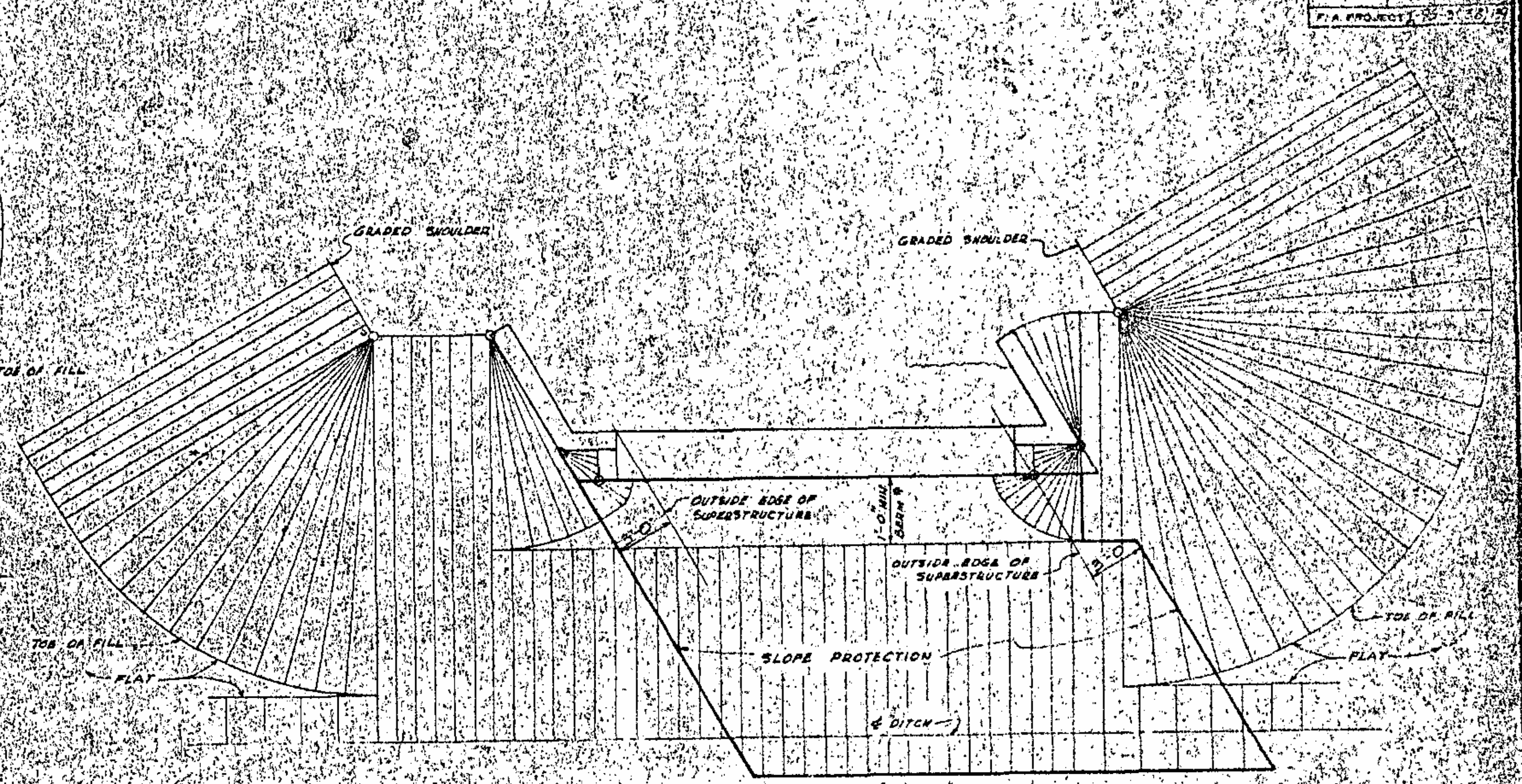
STA. [illegible]

ASSEMBLED BY: [illegible] DATE: Sept. 73
CHECKED BY: [illegible] DATE: Sept. 73
DRAWN BY: W. J. Bain DATE: Mar. 9, '64
CHECKED BY: G. T. Phillips DATE: MAR. 10, '64

4	N.C.	[illegible]
F.A. PROJECT I-95-2(36)[illegible]		

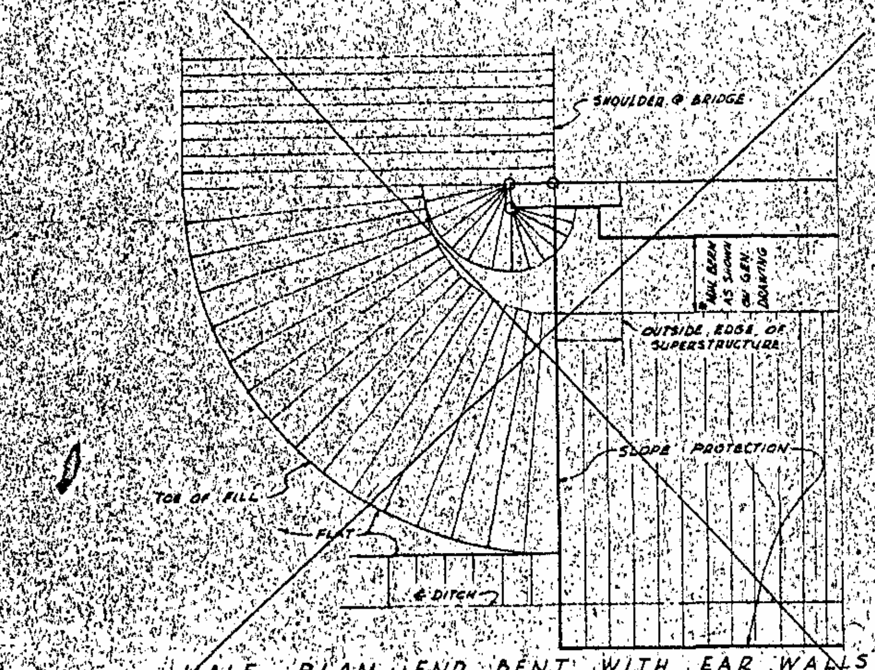


END BENT WITH EAR WALLS - SKEWED



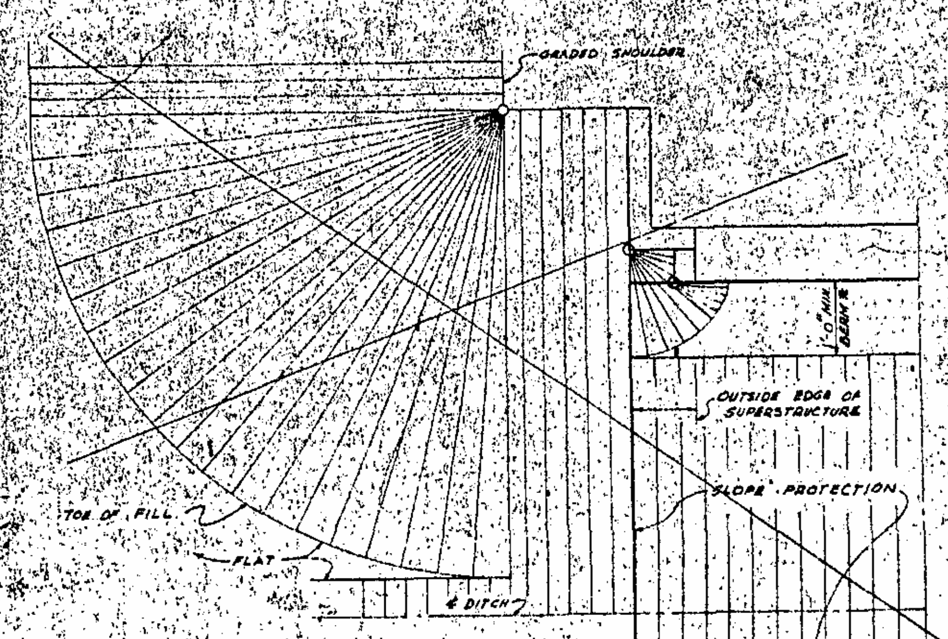
END BENT WITH SWEPT BACK WINGS - SKEWED

* NOTE: VARY BERM WIDTH AS NECESSARY TO FIT DITCH ALIGNMENT.



HALF PLAN END BENT WITH EAR WALLS - 90°

NOTE: OTHER SIDE SIMILAR.



HALF PLAN END BENT WITH SWEPT BACK WINGS - 90°

NOTE: OTHER SIDE SIMILAR.

Rev. No. 3 To change min. berm from 3'-6" to 1'-0" on End Bents with Swept Back Wings. ✓ O.W.R.
REV. NO. 2 TO ELIMINATE 90° CORNER AT TOE OF SLOPE FOR SKEWED BRIDGES. ✓ G.T.P.
REV. NO. 1 TO TAKE OUT DIMENSIONS FROM OUTSIDE EDGE OF SUPERSTRUCTURE TO OUTSIDE SLOPE PROTECTION. ✓ [illegible]

ASSEMBLED BY [signature] DATE Sept. 73
CHECKED BY [signature] DATE Sept. 73
DRAWN BY: P.G. ALFORD, JR. DATE FEB. '64.

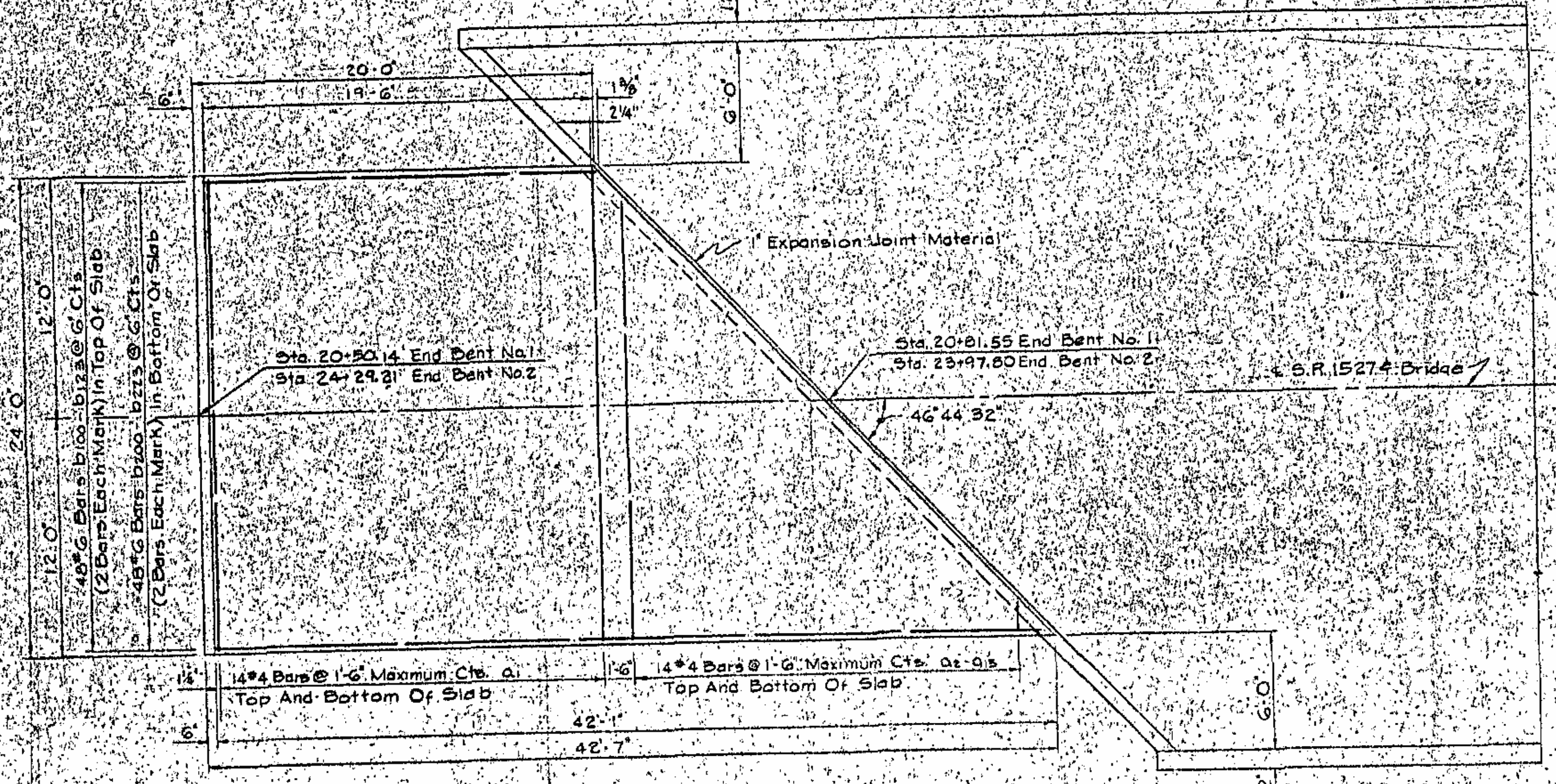
PROJECT NO. 8.11GN[illegible]
NASH COUNTY
STATION: 2[illegible]9+43.62 I-95
22+34.05 S.R. [illegible]

SHEET 2 OF 2

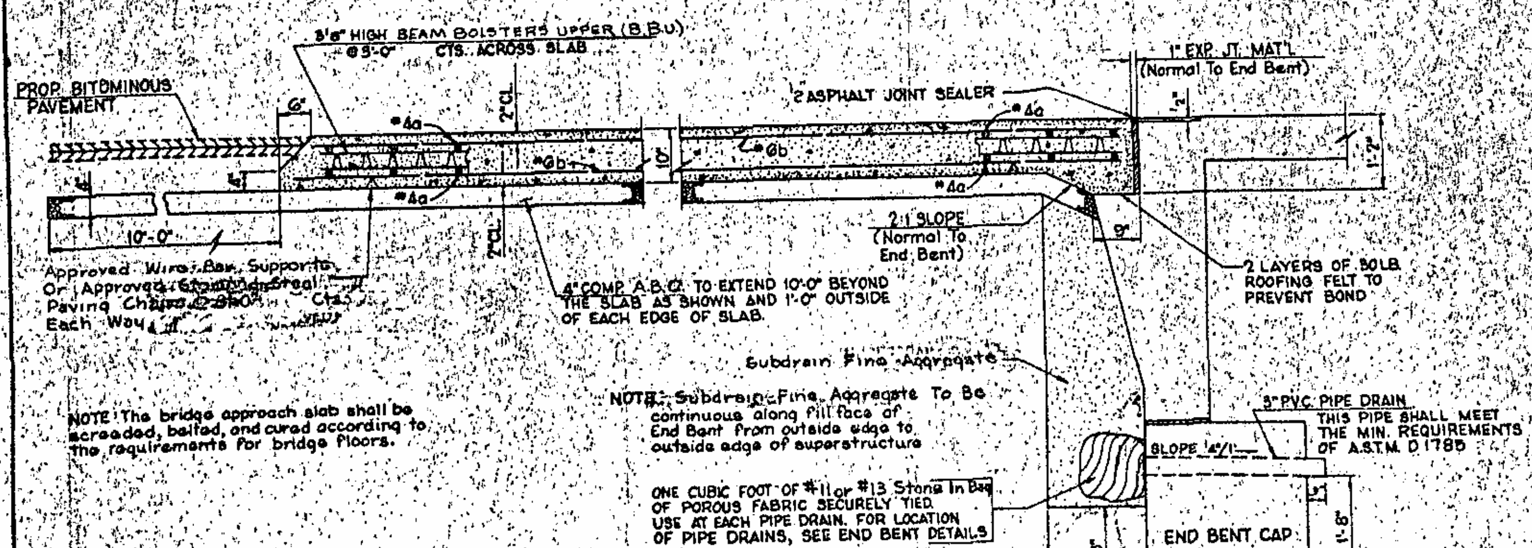
REVISIONS			
NO.	BY	DATE	
1	E.G.A.	10-27-64	
2	F.G.A.	2-5-65	
3	R.H.E.	10-31-68	

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
STANDARD
SLOPE PROTECTION PAVING
DETAILS
FEBRUARY 1964

FED. ROAD DIV. NO.	STATE	PROJECT
4	N.C.	8.1161706
F.A. PROJECT I-95-3(39)139		



PLAN @ END BENT NO. 1
Approach Slab @ End Bent #2 Similar By Rotation.



SECTION THRU SLAB

NOTE: For Requirements & Payment Of Approach Slabs, See "Special Provisions"

BILL OF MATERIAL											
FOR ONE UNIT — TWO REQUIRED											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
a1	28	4	Str.	23-8	443	b209	2	6	Str.	28-3	85
a2	2			22-1	30	b210	2			29-3	88
a3	2			20-6	27	b211	2			30-2	91
a4	2			18-10	25	b212	2			31-1	93
a5	2			17-3	23	b213	2			32-0	96
a6	2			15-8	21	b214	2			33-0	99
a7	2			14-1	19	b215	2			33-11	102
a8	2			12-6	17	b216	2			34-10	105
a9	2			10-11	15	b217	2			35-10	108
a10	2			9-4	12	b218	2			36-9	110
a11	2			7-9	10	b219	2			37-8	113
a12	2			6-1	8	b220	2			38-7	116
a13	2			4-6	6	b221	2			39-7	119
a14	2			2-11	4	b222	2			40-6	122
a15	2	4	Str.	1-4	2	b223	2	6	Str.	41-5	124
b100	2	6	Str.	19-5	58	Quantities For One Unit					
b101	2			20-4	61	Class A-A Conc. Cu. Yds.					23.5
b102	2			21-3	64	Reinforcing Steel Lbs. =					5049
b103	2			22-2	67						
b104	2			23-2	70	Two Units Req'd. at This Structure					
b105	2			24-1	72	Location					
b106	2			25-0	75	Total Quantities					
b107	2			26-0	78	Class A-A Conc. Cu. Yds. =					47.0
b108	2			26-11	81	Reinforcing Steel Lbs. =					10,098
b109	2			27-10	84						
b110	2			28-10	87						
b111	2			29-9	89						
b112	2			30-8	92						
b113	2			31-7	95						
b114	2			32-7	98						
b115	2			33-6	101						
b116	2			34-5	103						
b117	2			35-5	106						
b118	2			36-4	109						
b119	2			37-3	112						
b120	2			38-2	115						
b121	2			39-2	118						
b122	2			40-1	120						
b123	2	6	Str.	41-0	123						
b200	2	6	Str.	19-10	60						
b201	2			20-9	62						
b202	2			21-8	65						
b203	2			22-7	68						
b204	2			23-7	71						
b205	2			24-6	74						
b206	2			25-5	76						
b207	2			26-5	80						
b208	2	6	Str.	27-4	82						

PROJECT NO. 8.1161706

NASH COUNTY

STATION 2349+43.02 I-95
22+34.05 S.R. 1527

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT
OVERPASS @ S.R. 1527

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	5-60
1			3			TOTAL SHEETS
2			4			76

CHECKED BY A. M. Jones DATE 9-13-73
DRAWN BY R. R. Hildebran DATE 9-11-75

1507 ± Sq. Ft. = Total E Bt 1 & E Bt 2

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